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ABSTRACT

The Management, Operations, Review, and Evaluation project staff prepared a report on the Division of Transportation of the Montgomery County Public Schools at Rockville, Maryland. The 25 chapter report is divided into four parts: (1) The Division's mission, organization, resources, and success; (2) pupil transportation; (3) automotive services; and (4) auditor's report on the inventory system. It includes an executive summary, as well as the study methodology (Appendix A) and an independent routing study (Appendix B). (PN)

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MONTGOMERY COUNTY
PUBLIC SCHOOLS
ROCKVILLE, MARYLAND

Report on the Division of Transportation

February 1983

MORE MANAGEMENT OPERATIONS REVIEW & EVALUATION

EDWARD ANDREWS
Superintendent of Schools

Prepared by the Department of Educational Accountability

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REPORT ON THE DIVISION OF TRANSPORTATION

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EXECUTIVE SUMMARY

Part I

The Division's Mission Organization, Resources, and Successes

Mission of the Transportation Division (Chapter 1)

The Transportation Division is one of the largest and most visible service units in MCPS. It consists of two sub-units: (1) pupil transportation and (2) automotive services. In 1981, about 51,000 pupils were transported daily by school buses that, in the course of the year, travelled almost 10,000,000 miles, the equivalent of 400 trips around the earth at the equator. In the same year, the automotive services staff were responsible for the maintenance and repair of 1,061 vehicles and responded to 2,300 calls for road service for buses alone.

Organization, Functions, and Staffing Trends (Chapter 2)

The division's central office is located at the Shady Grove Transportation and Maintenance Service Park. Area transportation offices, under the direction of area transportation supervisors, are housed at the three school administrative area offices. Area transportation staff are responsible for all pupil transportation in their area. Maintenance and repair staff are assigned to the four transportation depots that were established when the division was decentralized: Shady Grove, Randolph, Bethesda, and Clarksburg. A supervising automotive mechanic is in charge of each depot, and depot staff are responsible for the maintenance and repair of vehicles assigned to the depot parking lot.

Since FY 1975, the number of maintenance and mechanical staff has been increased to 151 percent of FY 1975 staffing, the number of bus drivers to 116 percent, and the number of bus attendants to 213 percent. During the same period, however, the number of administrators and supervisors has been decreased to 83 percent of FY 1975 staffing, and the number of clerical workers to 85 percent.

The Division's Budget (Chapter 3)

The Transportation Division's budget has increased from $6.8 million in FY 1975 to $14 million in FY 1981. When corrected for inflation, the increase in FY 1975 dollars was 25 percent over the seven year period. Salaries accounted for only a small percentage of the increase, and economies have been achieved primarily by reducing the numbers of administrators, supervisors, and clerical workers. The supplies and materials budget has tripled since FY 1975. The purchase of buses accounts for the largest part of this increase.

In the past, a significant proportion of the Transportation Division budget (60 to 76 percent) was funded by the Maryland State Department of Education (MSDE). Beginning in FY 1982, the method of funding was changed, and MSDE now gives block grants. In the future, MSDE will allow a maximum increase in funds of 8 percent, though the increase could be lower. Within the next five years, if inflation continues, MCPS will have to fund at least 50 percent of the division's budget in contrast to the approximately 30 percent it has had to fund in the past. If present trends continue, this would mean that in FY 1988, MCPS would have to fund $14.6-million of a projected $29.2-million transportation budget.

The Division's Performance (Chapter 4)

The division carries out its mission successfully. When asked on questionnaires to give an overall evaluation of the bus service, 89 percent of the parents (of children who ride buses) who responded said they are satisfied or very satisfied with the service; 84 percent of the principals who responded said the service is good or excellent.

Bus drivers, on questionnaires, were asked to evaluate the maintenance and repair service. Of those who responded, the vast majority said their buses are in good condition and that when repairs are needed the work is completed promptly and well. Managers of the Supply Division and the Maintenance Division, whose vehicles are maintained by the Transportation Division, reported that service is excellent and that good relations prevail between divisions and among divisional staff.

Responding vs. Planning and Controlling (Chapter 5)

While the division performs its mission successfully, it does so almost entirely by responding to immediate demands. The result is a great human cost and probably too great a financial cost. There are many reasons for this: the conditions of operation, the reduction in the number of administrators and supervisors, and the way in which the division is organized. Under present conditions, it is almost impossible to determine how much of the $14 million that MCPS spends on transportation is well spent or how much could be saved by making changes in operations.

Part II

Pupil Transportation

Services and the Budget (Chapter 6)

Between FY 1975 and FY 1981, the number of pupils eligible for transportation decreased by 21 percent (more than 9,000). The number of pupils in regular school programs who are transported decreased by 23 percent. The number of buses assigned to regular runs by 6 percent, and mileage attributable to regular buses by 4 percent. During the same period the number of buses on routes increased by 17 percent, and the number of miles travelled by buses by 24 percent (2,000,000 miles). Increases in the number of buses and bus mileage are attributable, in part, to an increase in the number of school programs which require that pupils be transported to and among schools and to an increase in the number of special trips of all kind. It is probable that the largest increases have been caused by the growth in special education. Since FY 1975, the number of special education buses has increased by 140 percent, and mileage attributable to special education has increased by at least 168 percent.

Despite declining enrollment and revenues, the number of transportation services has been increased. The Transportation Division has been discouraged from accounting properly for funds. Field-trip and special-trip charges made to programs and pupils have not covered operating costs, and the division has been forced to absorb costs for programs that do not have budgets or that regularly overspend. The managerial and supervisory staff have been cut, and the smaller staff have almost no time to devote to the kind of planning that could possibly save MCPS thousands of dollars annually. Changes and improvements in the situation cannot be made by the Transportation Division alone, and many improvements can be effected only at the very highest levels of administration and by the Board of Education.

Recommendations: The superintendent and the Board of Education should establish a task force to review current transportation policies and to recommend additional policies for the operation of pupil transportation. At a minimum, policies should deal with the following: (1) transportation budgets for already existing programs for which transportation is provided, (2) procedures for annual review of all externally funded programs to determine and obtain adequate reimbursement for transportation, (3) procedures for controlling the growth of new programs that require transportation, (4) limiting the number of field and special trips, (5) procedures for revision of field trip charges, (6) development of guidelines for granting or refusing transportation, and (7) procedures for accurate accounting for transportation costs.

Special Education: A Major Service (Chapter 7)

Because the division's financial resources, staff, and staff time are limited, special education service can be said to compete with the regular bus service. The regular service transports about 47,000 pupils. In contrast, 3,000 pupils are transported on nearly 200 special education buses. these 3,000 represent only 6 percent of all pupils transported, but they account for 32 percent of all buses, 35 percent of all bus mileage, at least 32 percent of drivers' salaries, and 100 percent of the salaries of bus aides. Arranging for special education transportation absorbs a large amount of transportation staff time.

There are many major problems in the operation of special education service. Responsibility for the service is divided within the Transportation Division, with part assigned to the central office and the larger part assigned to area transportation offices. There is a lack of communication between the division and the Office for Special and Alternative Education. Discipline is a serious problem on many special education buses. Bus drivers and aides are not adequately trained to deal with special and alternative pupils. Long bus routes work a hardship on handicapped children and probably deprive them of class time (buses arrive late or leave early).

Major Recommendations: (1) Separate budgets should be established within the Transportation Division for regular and special education, providing true and adequate resources and financial records. (2) All special education transportation should be centralized within the division and with adequate staffing. (3) A Special Education and Transportation Division liaison team should be established; and systematic procedures should be established for determining placement of programs and communication of program locations and pupil assignments. (4) The Transportation Division should be assigned the responsibility for coordinating and standardizing the training of drivers and aides in special education transportation. (5) Limits of time, distance, or both to be travelled by special education pupils should be established. (6) Disciplinary procedures should be coordinated throughout MCPS.

Delivery of Services (Chapter 8)

Many problems in the delivery of service are caused by the lack of information and of MCPS policies. The Transportation Division does not obtain information far enough in advance to enable the staff to plan adequately for the opening of schools in September. Principals do not receive information about buses and routes in time to be able to assign pupils to buses or to give parents accurate information. Discipline is not a serious problem on regular buses. However, there is little exchange of information about disciplinary cases among schools, transportation offices, and parents, and therefore there are problems in how cases are handled.

Bus service is generally very good. The most important problems for principals and parents are lateness of buses on the way to school and buses that leave school before all pupils have boarded. Neither problem occurs with high frequency, however.

Few parents complain about bus service. However, Transportation Division staff spend too much time dealing with requests and complaints made by parents, at least partly because too many individuals become involved in a single call: parent, principal, division central office staff, area transportation office staff, etc.

Recommendations: (1) Principals should be required to maintain up-to-date pupil records and to provide information to the Transportation Division about pupils who are to be transported. (2) Uniform procedures should be developed to determine eligibility for transportation and to inform parents and pupils. (3) A central community relations unit should be established within the division (4) Uniform policies and procedures for handling discipline cases should be developed.

Bus Drivers: (Chapter 9)

The number of full time equivalent drivers allowed to the division has increased regularly since FY 1975, but the increase has not kept pace with increases in buses, bus mileage, and services. To obtain enough drivers, the division must pay regular drivers out of the substitute account. This is a potentially costly procedure because it increases complexity of payroll and makes it difficult to determine adequate reimbursement for transportation costs.

Turnover and absenteeism are high among drivers because driving is a part-time job with part-time wages and benefits. Absenteeism creates a major problem each day: obtaining enough substitute drivers to cover all open runs.

Responsibility for training drivers is widely scattered, and the training itself is not well coordinated. Drivers' evaluations suggest that the training provided is not always adequate and that many important topics are not covered. Supplementary training for drivers of special education buses is offered by special and alternative schools and centers, but is not well coordinated or adequate.

MCPS policies and procedures do not deal adequately with accidents. Managers of the Transportation Division seem to rely on improved supervision to reduce accidents, though the major errors that account for 80 percent of driver-caused accidents are those that can probably best be corrected by a combination of intensive classroom training, supervised practice, and periodic retraining.

Recommendations: (1) The division should be provided with the number of FTE drivers for which a need can be documented. (2) Using the substitute account to pay regular drivers should be prohibited. (3) Attendance records and payroll procedures within the division should be simplified. (4) The position of vehicle operator instructor should be upgraded and the instructor should be responsible for offering and/or coordinating all training. (5) The vehicle instructor should be provided with adequate staff. (6) A divisional task force should be formed to review training needs, and, eventually, a permanent training committee should be formed, including representatives of Transportation, Special and Alternative Education, and Staff Development. (7) Policies and procedures dealing with school bus accidents, points, and penalties should be reviewed and updated.

Proposal for a Relief Driver Pool (Chapter 10)

Finding substitutes to cover open runs absorbs staff time that could be better devoted to other jobs (planning, management, supervision). Large percentages of principals reported that substitute drivers elicit more complaints about lateness, other operational problems, and discipline than do regular drivers.

The MORE team recommend the formation of a permanent relief driver pool and the creation of two new positions: Relief Driver I and Relief Driver II. A pool of 60 Relief Drivers I (4 hours a day) and 5 Relief Drivers II (8 hours a day) would be equivalent to about 80 day-by-day substitutes and would cost only about $14,000 more per school year. The potential benefits to MCPS would be reduction in complexity of payroll and saving of clerical time, increase in the amount of time available to supervisors to carry out essential jobs not now being done, increase in the number of supervisory assistants (relief drivers II), and improved performance of relief drivers in comparison to substitutes.

Recommendation: The MORE relief driver proposal should be adopted and implemented after review by the Transportation Division and the Office of the associate superintendent for Supportive Services.

Bus Aides (Chapter 11)

Bus aides are assigned only to special education buses, but not all special education buses are currently assigned aides. MCPS regulations do not address the issues of whether or not aides are to be assigned to special education buses at all or what criteria should be used to determine whether or not an aide will be assigned to a given bus. No evidence was found that it is necessary to assign an aide to every special education bus, but aides must be assigned to buses used by children who need special help. Recruiting aides is difficult, and turnover and absenteeism among aides is high. The reasons are probably the difficulty of the job, the part-time wages, and the split hours.

Though aides work directly with some of the most severely physically and emotionally handicapped pupils in MCPS, they are given virtually no training. This has created problems between aides and drivers, aides and pupils, and between the Transportation Division and some special and alternative centers. Better and better-coordinated training must be offered to aides who are already employed and those who will be hired in the future. Training should be the responsibility of the vehicle operator instructor (upgraded) of the Transportation Division, but provided by specialists in special education.

There are potential control and cost problems associated with aides. For example, in FY 1982, Mark Twain school provided its own aides, special education aides who volunteered to do bus duty. The pupil transportation staff have designated two substitutes per area for priority service on Mark Twain buses, and drivers of all of the buses that serve the school work at the school for an hour per day. To some extent these arrangements reduce the division's control over staff and operations.

Recommendations: (1) Policies, regulations, and procedures for determining the number and assignment of aides, training, and the evaluation of aides should be developed. (2) An attempt should be made to recruit Montgomery College students as aides. (3) The vehicle operator instructor should be assigned responsibility for training and coordinating training of aides. (4) The training of aides should be included in the responsibility of previously-recommended training committee.

Management and Supervision (Chapter 12)

The organizational structure of pupil transportation and the deployment of the staff interfere with management, supervision, and the control of operations and costs. Managers and supervisors are separated from one another and from the central office, supervisors are separated from the buses and workers they are supposed to supervise, and there is no constant managerial connection between depots and area offices. Pupil transportation is understaffed, and area administration breaks an already too small staff into even smaller units. Efficiency is reduced by the duplication of tasks and work in the three area offices.

Supervision and control are inadequate. Even the minimal supervision required by MSDE and by the MCPS evaluation process is not always carried out. There is reason to believe that lack of supervision and control results in increased costs.

There is almost no limit to the number of appeals to higher authority that can be made by parents and MCPS staff who make demands on the pupil transportation staff. Thus there is a layer of "external management" which interferes with Transportation Division control and which also wastes time and increases costs.

The Transportation Division has submitted a plan for the reorganization of pupil transportation. The plan, however, is not truly a reorganization plan and does not address most of the problems caused by organization, understaffing, and the deployment of staff.

Recommendations: A discussion of the most important recommendations that stem from the findings is postponed until Chapter 15, in which the MORE team offers a plan for reorganizing and staffing pupil transportation. It is recommended here that the Board of Education adopt policies, regulations, and procedures that will give decision making authority to managers of the Transportation Division except in major or unusual cases and that will limit the number and kind of appeals that can be made.

Planning and Information (Chapter 13)

The goal of planning should be the reduction of pupil transportation costs. Reducing the number of miles travelled by school buses offers the only hope for reducing all costs (though some costs can be reduced independently without affecting others). Mileage can be decreased only if the entire bus route network is efficiently designed, which can be achieved only through planning.

The present system of planning routes and resources may result in increases rather than decreases in mileage and therefore in all other costs. Each year, some problems may have been solved by adding buses and increasing mileage. Planning has been backwards, i.e., based on after-the-fact load counts that show how many pupils are on buses, but not how many are eligible for transportation or should be riding.

The county's Ride-On system, with 90 buses at peak load, employs 11 full-time planners and analysts. The Transportation Division, with more than 600 buses, employs not even one full-time planner. The pupil transportation staff has been so reduced that staff members have difficulty planning day-to-day route modifications and cannot do some long-range planning. The situation encourages finding quick, easy, and expensive solutions to problems.

Because pupil transportation is administered by areas, records are scattered and no one has an opportunity to see the countywide bus route network. Inefficiencies which might increase costs are therefore not likely to be detected. Much of the information on which planning should be based is not available in MCPS, and the pupil transportation staff must rely on inaccurate and incomplete information.

The Division of Administrative Analysis and Audits contracted for an independent routing study to determine the effects of the following on costs: basing routes on pupils' addresses, concentrating on reducing route mileage, enforcing existing MCPS regulations. The study was confined to the routes of buses serving Kennedy High School. The contractor was able to reduce cumulative one-way, one-run route mileage by 15.4 miles or an average of .91 miles per bus. If the results of the study were generalized to the entire bus fleet, maintenance and operating costs would be reduced by $334,908 per year. The study thus demonstrated the potential benefits of planning and enforcement of regulations.

Recommendations: (1) A task force should be formed to determine data and other needs of the Transportation Division. (2) There should be a review and revision of MCPS regulations and development of additional policies and procedures to determine eligibility for transportation and the exchange of information. (3) A pupil identification system should be investigated.

Current Attempts to Reduce Costs (Chapter 14)

The Transportation Division is expected to engage in long range planning and to propose the adoption of methods to reduce pupil transportation costs. Recently, at the request of the Board of Education, the pupil transportation staff have attempted to consolidate bus stops, and the division director has made a tentative proposal to reduce the size of the bus fleet by drastically altering school schedules. The staff have also been investigating computer routing of buses.

The stop consolidation program has had modest success. The division staff estimated that $12,000 was saved in FY 1982 and that perhaps as much as $30,000 will be saved in FY 1983. Drastic revision of school schedules would tend to pass Transportation Division planning problems to the schools, would probably not be acceptable to principals and parents (see questionnaire data), and would probably not decrease mileage or the size of the bus fleet significantly. A present, the division does not have the information or the centralized organization that would make it possible to set up a countywide computerized routing system.

Recommendations: (1) The stop consolidation program should be continued. (2) The proposal to alter school schedules drastically should be set aside for future consideration only if there is no alternative. (3) Computer routing of buses should not be considered until the division has the necessary information about pupils, the centralized organization, and the technical assistance to make it feasible to adopt the technology.

A Proposal for Reorganizing Pupil Transportation (Chapter 15)

It has been shown in this report that MCPS is attempting to operate a major transportation system with a minimum of staff, planning, management, and supervision. The pupil transportation staff are trapped in a self-perpetuating cycle in which they must constantly respond to demands over which they have little control and must solve problems in ways that increase the number of operational problems and probably increase costs. The MORE team believe the way to stop the cycle is to centralize, reorganize, and modestly increase the size of the pupil transportation staff.

At a minimum, the MORE plan requires the following:

- Complete separation of transportation and area administration
- Centralization of pupil transportation staff in one facility
- Organization of the staff into functional units
- Upgrading of some positions and addition of 6 new positions (increased efficiency in planning alone would offset costs and, in addition, reduce maintenance and operating costs)
- Creation of the position of dispatcher, assignment of one dispatcher to each depot
- Assignment of a limited number of route supervisors to each depot
- Formation of a pool of permanent relief drivers, assignment of relief drivers to depots

The functional positions and units would be as follows:

- Pupil Transportation Supervisor and Staff
- Planning and Data Analysis Unit
- Training and Field Service Unit
- Community Relations Unit
- Bus Operations
- Depots: dispatchers, route supervisors, relief drivers, drivers, aides

The MORE team believe this proposal attacks and solves all pupil transportation problems simultaneously. Major improvements would include the following: Managers and supervisors would no longer be separated from one another. The staff would have the time, ability, and organization to carry out centralized, countywide planning. There would be constant supervision of buses and workers at depots and a direct supervisory link between the central office and depots. While the staff would continue to be small, specialization by function would increase staff efficiency and eliminate duplication of tasks and work. Training would be coordinated with operations. Bus operations staff would be responsible only for day-to-day operations, not also for all other tasks.

Recommendation: The MORE plan for centralizing and reorganizing pupil transportation and for increasing the pupil transportation staff should be adopted and implemented.

Part III

Automotive Services

Description of Services (Chapter 16)

The services performed by the staff are described. MSDE and MCPS mandate preventive maintenance standards for school buses, and the Transportation Division has developed additional standards. These standards include monthly service, an annual preventive maintenance check, and three annual state inspections. MSDE and MCPS do not mandate preventive maintenance standards for other MCPS vehicles. The staff perform repairs on all but a few of the vehicles owned by MCPS and also provide emergency road service. The Transportation Division is responsible for maintaining bulk storage tanks and pumps for gasoline and diesel fuel and for the operation of service stations. The division is also responsible for maintaining a large computerized parts inventory and for supplying data on fuel and repair costs to other MCPS units that operate vehicles.

Services and the Budget (Chapter 17)

The cost of automotive services increases (or decreases) with the number of MCPS vehicles and number of miles travelled by vehicles. However, while school buses have been added to the fleet, the allowance for bus maintenance and operating costs has been decreased. Labor costs incurred by the Transportation Division on behalf of other units that operate vehicles are not charged to those units and therefore artificially inflate the automotive services budget. When cuts are made in the budget, either automotive services or pupil transportation are penalized for absorbing other units' labor costs. Though the division is responsible for providing other units information about costs (except labor), managers of those units say they are not being given adequate or timely data and that they have little control over spending.

Major Recommendations: (1) All units should budget and be charged for all automotive maintenance costs. (2) Increases or decreases in the automotive services budget should be determined by increases or decreases in the numbers of vehicles the unit maintains and by documented needs. (3) Managers of units that operate vehicles should be provided with accurate and timely cost data and be able to control some automotive maintenance costs.

Delivery of Service (Chapter 18)

The preventive maintenance schedule for school buses provides for frequent mechanical checks, adjustments, and repairs. Bus drivers do not always adhere to the schedules, and the system for notifying them of missed service appointments is cumbersome and time consuming. A better system or schedule for inspecting, repairing, and replacing tires seems to be needed. There is good evidence that drivers are not given adequate training in the mechanical operation of buses and are responsible for many unnecessary road calls. Present Transportation Division policy causes communication problems when buses break down on the road. Maintenance Division vehicles are apparently being serviced with some regularity, but probably not on an optimal schedule.

Major Recommendations: (1) A better system is needed for scheduling service appointments and for notifying bus drivers about missed appointments; assigning a dispatcher to each depot (see Part II) would solve these problems. (2) The division needs to develop an improved system for storing, inspecting, and maintaining tires. (3) All school buses should be equipped with two-way radios.

Depot and Shop Problems (Chapter 19)

There is not adequate parking space at depot lots for all school buses, and the problem cannot be solved cheaply or easily. Because about 118 buses must be parked off-depot, there are problems of supervisory control over how buses are used and in scheduling maintenance. The division director therefore recommends establishing satellite parking lots and refueling facilities. Garage facilities at the Randolph depot are inadequate for the number of vehicles to be serviced there, and one of the lifts is unuseable. There are limited facilities at depots for drivers, and drivers often enter shops, posing a safety hazard to themselves and others. Though the Maintenance Division is supposed to maintain shop equipment (lifts, etc.), it is not equipped to do so. The Transportation Division has therefore assigned its own mechanic to the job, though this is a makeshift arrangement. No provisions were ever made for distributing parts from the Shady Grove central shop to the outlying depots. A worker who is assigned to "light duty" now delivers parts, but the position itself is not funded in the budget.

Major Recommendations: (1) Transportation Division managers should provide documented financial justification in all cases in which a school bus is parked at a driver's home; buses now parked at driver's homes without such justification should be parked at depots. (2) The recommendation to establish satellite parking lots should be given careful consideration. (3) Additional work space and one additional lift should be provided at the Randolph depot. (4) The Transportation Division should formulate rules and penalities to keep drivers out of shops. (5) The position of "parts runner" should be created and funded. (6) A cost-effectiveness study should be done by the Transportation Division to determine and document the best and least expensive way to carry out a maintenance program for shop equipment.

Staffing and Personnel Issues (Chapter 20)

While automotive services may not have enough workers, the major problem may be the distribution of staff. The Randolph depot needs more workers on both shifts, but there is no room for them at present. A night shift is needed at Clarksburg, and the supervisor recommends that it be created by reassigning day-shift workers to the night shift. "Understaffing" can occur in automotive services when workers are placed on so-called light duty. MCPS has been fortunate in getting already well-trained workers, but since automotive technology changes each year, workers must receive continuing training. On-the-job training in automotive services takes care of some needs. In the past, training offered by manufacturers has taken care of the rest, but opportunities may decrease if budget cuts or inflation reduce the division's ability to pay for training. There are too few line supervisory positions in automotive services.

Major Recommendations: (1) Additional work space and at least one more safe lift should be provided at the Randolph depot, and additional workers should be reassigned to Randolph and/or provided for in the budget. (2) A night shift at Clarksburg should be created by reassigning day shift workers. (3) Line supervisory and specialist positions should be created (see Chapter 23 for recommendations).

Management and Supervision (Chapter 21)

Though automotive services is decentralized, the staff is organized and equipped to manage operations. However, there are some flaws in an otherwise sound structure, some caused by events that occurred between FY 1977 and the present: decentralization, installation of two computer inventory systems, and frequent turnover of managers (three division directors and three supervisors of automotive maintenance). During this difficult time, jobs had to be assigned to whatever staff members were available, and some of these informal managerial job assignments continue, though they are no longer appropriate.

At present, the supervisor of automotive maintenance devotes too much of his time to jobs that are primarily technical, not administrative. The senior accounts clerk is responsible for computer operations, which should be coordinated by the supervisor of automotive maintenance. The repair services supervisor and the supervisor of the Shady Grove shop, who is treated as a central office staff member, do some of the coordinating jobs that should be done by the supervisor of automotive maintenance. The repair services supervisor, however, does only some of the technical work for which he is responsible according to the job description. At the depots, supervisors spend 50 percent or more of their time doing clerical work and therefore cannot devote full time to supervising or consulting with workers. The major management problems are primarily matters of lack of control over operations and are mainly the result of scattering of responsibility. The major problems in supervision are lack of control over the quality of work and over parts and supplies.

Major Recommendations: Postponed until Chapter 23.

Technological Planning (Chapter 22)

The automotive services staff can help reduce vehicle operating costs only in the following ways: developing efficient ways to do repairs or to make modifications, evaluating products already in use to identify those that give the best service at the lowest cost, testing new products or technologies for cost effectiveness in MCPS. At present, the staff cannot engage in product evaluation because the wealth of data entered into various computer systems cannot be extracted in useful form. Recently the division attempted to carry out a test of the cost effectiveness of diesel school buses, but the test was not well conducted and the cost effectiveness of diesels was not established. MCPS was invited to join the county government in a low-cost, low-risk test of the use of liquid propane as a fuel in Maintenance Division (and other) vehicles, and successful application of the technology might have saved MCPS $100,000 a year. MCPS did not cooperate, however, primarily because too many departments, divisions, and managers were involved in making decisions (i.e. responsibility was too diffused).

Major Recommendations: (1) The computer support provided to automotive services should be evaluated and the system should be revamped so that the unit can evaluate products, determine costs, and engage in product testing. (2) A permanent committee should be formed to oversee product evaluation and testing.

Strengthening the Structure of Automotive Services (Chapter 23)

Automotive services does not need to be reorganized, but the structure needs to be strengthened. The MORE staff recommend that this can be done over approximately a two year period in the following ways:

- Eliminate the present position of repair services supervisor and create, at a lower grade, the position of automotive technical specialist.
- Upgrade the position of the present supervising automotive mechanic in charge of the Shady Grove shop and upgrade the positions of present lead automotive mechanics.
- Create line supervisory and specialist positions by establishing three grades of auto mechanics, giving mechanics of the highest grade supervisory responsibilities.
- Create two grades for automotive service workers.
- Downgrade a number of automotive service worker positions and create the lower-level positions of lubrication worker, service station attendant, and parts runner.
- Add two FTE clerical positions fixed at four half-time positions, with one half-time position assigned to each depot.
- Retitle some positions to make distinctions that are not presently made or are confusing.

It is estimated that the MORE plan would result in an increase of only about $4,584 in salary costs, which is very close to no increase at all (because estimates exaggerated some costs). The plan would provide automotive services with a full-time technical planner, six additional shop supervisors, and four half-time clerks. It should result in increased control over operations, planning and inventory.

PART IV

AUDITOR'S REPORT ON THE INVENTORY SYSTEM

Introduction to Part IV

The purpose of the audit was to determine possible causes for the large adjustments in the Transportation Division inventory that have been encountered in recent years and to evaluate the efficiency of the inventory system as a part of the MORE study. The main concern was to ascertain if information being generated by the inventory system is processed efficiently and accurately. Parts, supplies, tires, and tubes are accounted for on a computerized perpetual inventory system; gasoline and oil are accounted for on a partly computerized inventory system. Both systems provide data to the Accounting Division and to the so-called transportation system.

Vehicle Parts Inventory System (Chapter 24)

The procedure for receiving parts and supplies is cumbersome and lends itself to error because of the large number of repetitive entries that must be made. Parts requisition forms are not numbered, and it is possible that when parts are transferrred from the central stockroom at Shady Grove to the depots or among depots groups of transfers might be omitted when the inventory is updated. Direct charge items are not reflected in the perpetual inventory account, which adds unnecessary confusion. Forms like parts requisitions and repair orders are not controlled by number, and the issue of forms is not controlled. Parts numbers are confusing and are not standardized. The system for recording and accounting for rebuilt parts overstates their inventory value. Routine reports are not used regularly or adequately for control and management. Storage facilities for tires are inadequate, and stockrooms are not always supervised or secure. The supervisor of automotive maintenance plays too small a role in coordinating and managing the inventory system.

Major Recommendations: (1) Detailed recommendations for improving the system that are presented in the chapter should be implemented. (2) Routine reports should be used for control and management. (3) Adequate storage facilities should be provided for tires, and stockrooms should be adequately staffed and made secure.

Gasoline Control System (Chapter 25)

Gasoline, oil, and transmission fluid are accounted for on the GasBoy computer system and by a parallel manual system. When gasoline is delivered, it is not metered at the tank. Dipsticking of tanks does not always produce accurate readings. There are many problems in the GasBoy system. Delivery cards that trigger the system are issued to vehicles, but drivers may use cards not assigned to their vehicles. Correct odometer readings are not always entered into the system at the pump. Pumps can be switched from automatic (computer) to manual, and withdrawals will not be recorded by the system. Pumps are not always accurately calibrated. Memory banks at pumps are sometimes knocked out by electrical storms, and data are lost. There is no reliable system for checking the accuracy of information produced by GasBoy. There is a manual system for recording withdrawals, but no method to guarantee that withdrawals are recorded or that those that are recorded are entered into the accounting system. At pumps where the manual system is used, security is almost nonexistent. At depots, automotive service workers are assigned to pump gas but are not full-time attendants. The gasoline system generates a considerable amount of data, but at present, much of the data are not readily available. Regular reports are not used for management and control. With some internal work, the perpetual inventory system can be improved and useful reports can be generated. At longer range, the entire gasoline system should be reevaluated.

Major Recommendations: (1) Detailed recommendations made in the chapter should be implemented to improve control over the gasoline inventory and the accuracy of data produced by the system. (2) The Transportation Division and the Data Processing Division should work together to develop useful reports and to study the feasibility of a completely computerized inventory. (3) Service station attendant positions should be created as recommended in Chapter 23 to improve security of pumps and tanks. (4) A task force should be formed to investigate alternatives to the present gasoline system.

570L/4

ACKNOWLEDGEMENTS

The MORE staff extend their thanks to the following individuals and groups who made major contributions to this study:

Mrs. Louise Nichols, secretary to the Division of Administrative Analysis and Audits, who saw this report through from its very rough beginnings to the final printed form.

The secretaries, clerks, and other members of the support staff of the Transportation Division, who were unfailingly courteous and who, even under the pressures of their own work, found time to answer our questions, search files, and provide us with documents and data.

The managers and supervisors of the Division of Transportation whose identification of issues, understanding of problems, and willingness to take the time to talk with us made it possible for us to carry out the study.

The managers of the Department of School Facilities, the Department of School Services, and of the Maintenance Division and the Supply Division, who willingly met with us for interviews.

The parents, principals, bus drivers, and automotive maintenance workers who displayed their interest in the study by responding in such large numbers to our questionnaires.

SOME GENERAL CAVEATS

The MORE project staff have made every effort to assure that the quantitative data and other information presented in this report are accurate. However, the following cautions should be observed.

Changing Events

Data collection and analysis and the writing of the report took more than a year. During that time, events sometimes overtook and passed what had already been written. The following is an example:

- Throughout the report, it is said that the Transportation Division does not get adequate and accurate information about pupils who are to be transported. It is pointed out that MCPS regulations do not cover the situation and that, in any case, the computerized pupil data base contains inaccuracies.
- In the summer of 1982, the deputy superintendent instructed principals to carry out existing regulations that deal with record keeping and to provide transportation supervisors with information about pupils. As a result of the deputy superintendent's action, the Transportation Division began to get such information regularly.
- However, MCPS regulations that deal with eligibility for transportation and information continue to be inadequate, and there are still many errors in the pupil data base.

In this case and in all others that the MORE staff are aware of, the problems described, the data presented, inferences and conclusions derived from the data, and recommendations have not been altered.

Quantitative Data in General

The following considerations apply to all quantitative data;

- Data collection had to be stopped in the summer of calendar year 1982. At that time, some data for the 1981-82 school year were not yet available and could not be included in the report.

- It is accepted practice in MCPS to make past budgets conform to the present budget (for example, position titles are changed). Therefore, it is not always possible to find an exact correspondence between budgets and other historical financial and personnel records.

- Whenever the MORE staff had to select data from conflicting sources for analysis and presentation, the most conservative data were used to avoid exaggeration.

Trends in cost, staffing, and the like, and the conclusions derived from analysis of trends would not be changed by updating data.[1] The use of the least instead of the most conservative data would reinforce the inferences, conclusions, and recommendations of the MORE staff, not contradict them.

Data From Transportation Division

Though all of the data obtained from the Transportation Division are as accurate as the MORE staff could make them, some may not be entirely accurate for the following reasons that are discussed at length in the report:

- The division makes a variety of reports to different agencies: MSDE, MCPS, MVA, etc. Reporting requirements are not uniform, and both data elements and the data differ among reports. It is often difficult to find a "true" number. (Chapter 13.)

- In recent years, there have been large discrepancies in the division's computerized inventory. (Part IV, auditor's report.)

- Control over the computerized GasBoy system, the source of fuel and mileage data, is inadequate. (Part IV, auditor's report.)

- There is inadequate control over some operations that should be the source of data. (Chapter 8, 10, 12, and 13.)

When there were conflicts among data sources, the MORE staff used the most consistent values and, whenever possible, attempted to find an independent corroborating source. As in other cases, the data selected for analysis and presentation are the most conservative and avoid exaggeration. The use of the least conservative data would, again, reinforce the inferences, conclusions, and recommendations of the MORE staff.

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[1] Some test were run to determine this just before the report went to press.

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PART I

THE DIVISION'S MISSION, ORGANIZATION, RESOURCES, AND SUCCESS

CHAPTER 1

THE MISSION OF THE TRANSPORTATION DIVISON

The Transportation Division is one of the largest service units of the Montgomery County Public Schools (MCPS) and probably the most visible. The driver of the school bus is the first MCPS staff member who is seen at the beginning of the school day and last to be seen at the end of the day by about 50,000 pupils. Furthermore, like so many mobile advertising signs, the more than 600 yellow school buses are seen daily by thousands of citizens of the county, the majority of whom have no children in MCPS and have little or no other contact with the schools.

Despite this visibility, the many functions of the division are probably not well understood, even by many MCPS staff members. As is shown in Exhibit 1.1, the division does far more than operate a home-school-home bus service. Instead, it combines the functions of a transit system, tour bus line, travel agency, car rental agency, automobile service station chain, repair garage chain, and accounting service.

Comparing the Transportation Division to a large travel conglomerate is not hyperbole, as can be seen in Exhibit 1.2, which gives some selected illustrative data. The "transit system" alone is a major operation. Montgomery County covers about 500 square miles, and MCPS pupils live virtually everywhere within that area. Parts of the county are urban, with very high population and road density. Thus, in MCPS Areas 1 and 2, school buses must travel on some streets where there are awesome traffic problems. Area 3, however, is very large and has comparatively low population and road density. Pupils, schools, and bus stops are widely scattered. The many narrow, high crowned rural roads in the area present their own particular driving hazards, especially in bad weather. In all areas, the stop-and-go nature of school bus driving increases wear on the buses and therefore increases the need for maintenance.

Exhibit 1.1

TASKS PERFORMED BY THE DIVISION OF TRANSPORTATION

Transportation

- Transport all eligible MCPS pupils and eligible private school pupils between home and school by bus
- Arrange, pay, and account for the private transportation of handicapped pupils between home and school or special program within or outside of the county or state
- Transport pupils among schools for classes or special programs
- Transport pupils on field, athletic, or other school-related trips
- On special occasions, provide transportation for MCPS staff members (e.g., shuttle service during multi-ethnic conventions)
- For a fee, arrange for and provide transportation for other educational institutions, community groups, and county residents in general (e.g., Montgomery County Fair shuttle)

Service and Maintenance

- Operate "service stations" at which all MCPS and some county government vehicles refuel
- Provide lubrication, oil change, tune-up, and maintenance check for all MCPS vehicles; provide records of fuel consumption, maintenance, and repairs to other MCPS units operating vehicles
- Make mechanical repairs on almost all MCPS vehicles (the few exceptions are primarily very large vehicles)

Other Service

- Operate the MCPS motor pool
- Keep fuel records for driver education vehicles (not owned by MCPS)

Exhibit 1.2

SOME SELECTED DATA
SHOWING MAGNITUDE OF THE
TRANSPORTATION DIVISION'S MISSION

Montgomery County[a]		Pupil Transportation[b]		Service and Repair[b]	
Square miles	497	Number of schools	181	Number school buses	672
Persons Per Square Mile		School bus routes	602	Number Maintenance Division vehicles	262
County	1,165	Pupils transported by MCPS bus	51,452	Number Supply Division vehicles	32
MCPS Area 1	2,267	Number of field trips per year	11,000[c]	Number motor pool vehicles	75
Area 2	2,725				
Area 3	395				
Miles of road	1,600	School bus miles 1 year	9,817,739	Miscellaneous other vehicles	25
		Field trip miles 1 year	537,000[c]	Driver Education vehicles	55
		Gallons of gas for buses 1 yr.	2,000,000[c]	Total vehicles	1,121
		Number pupils transported by private vehicle	869	Number of bus road calls responded to	2,300

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[a] Based on 1980 census information supplied by the Montgomery County Planning Board. When census districts were divided by school administrative area boundaries, approximations were made.

[b] Data for end of year FY 1981

[c] Rounded

The numbers of everything with which the divison deals are impressive. In 1981, 51,000 pupils were transported daily to and from schools over 1,600 miles of road.[1] The school buses travelled almost 10,000,000 miles, the equivalent of 400 trips around the earth at the equator or 21 round trips to the moon. In the course of their travels, buses used about 2,000,000 gallons of gasoline, enough to enable the owner of a car getting 20 miles per gallon to drive 15,000 miles a year for more than 2,600 years.

In 1981, the services and repair staff were responsible for the maintenance and repair of 1,066 vehicles and for keeping fuel consumption records for the 55 driver education cars. Since school buses are serviced once a month, the garage staff performed more than 6,000 changes of oil and "lube jobs" on buses alone during the year. As is true of all motor vehicles at one time or another, especially under the traffic conditions in Montgomery County, some of the buses had problems while on the road. The service staff responded to 2,300 calls for road service.

This, then, is the mission of the Transportation Division. Transporting children to and from school is its primary job. However, over the years, more and more programs have been added to MCPS and many changes have been made in the conditions of operation of the schools. Many of them depend on moving children from place to place by bus during the school day. Finally, it is also the division's responsibility to maintain all other MCPS vehicles so that many school services can function.

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[1] More than 100,000 riders a day if one counts the round trips.

CHAPTER 2

ORGANIZATION, FUNCTIONS, AND STAFFING TRENDS

Organization and Functions

Until 1977, the Transportation Division was housed at the Lincoln Center in Rockville. Thereafter, with the establishment of four transportation and maintenance depots (Shady Grove, Clarksburg, Bethesda, and Randolph), the division was decentralized. The division's central office is now at the Transportation and Maintenance Service Park (usually called the Shady Grove depot), which also houses a service and repair depot. The service and repair staff work at or out of the four depots. The pupil transportation area office staff are assigned to MCPS school area administrative offices. Exhibit 2.1 shows the way in which the division is now organized to carry out its mission, and Exhibit 2.2 shows the locations of offices and depots.

Central Office

The central staff consists of the division director, the supervisor of automotive maintenance, the repair services supervisor, two transportation specialists, the vehicle operator instructor, and the central secretarial and clerical staff. As is true in all MCPS division offices, the central staff are responsible for coordination of operations, budget planning, and a wide variety of other usual and routine tasks. One of the two transportation specialists is assigned primarily to special education transportation, arranging for transportation to several of the supplementary centers (but not other special education routes) and for private transportation for pupils who cannot ride on school buses or who attend programs outside the county. The vehicle operator instructor is responsible for psycho-physical screening and training new drivers and aides.

Exhibit 2.1

ORGANIZATIONAL STRUCTURE
OF THE TRANSPORTATION DIVISION

Associate Superintendent For Supportive Services

Director, Department of School Services

Director,
Division of Transportation[c]

Vehicle Operator Instructor (1)[c]

Transportation Specialist (2)[c]
Secretary and Clerks (4)[c]

Area Transportation Supervisor (3)[a]
Secretary and Clerk (1 each per area)[a]

Transportation Assistant (6)[a]

Bus Operators[ad]
Bus Aides[ad]

Supervisor of Automotive Maintenance (1)[c]
Account Clerk (1)[c]

Repair Services Supervisor (1)[c]

Supervising Auto Mechanic (4)[d]
Lead Automotive Mechanic (3)[d]

Auto Service Workers[d]
Tire Repairers[d]
Auto Mechanics[d]
Parts Clerks[d]

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c = Central office at Shady Grove Road

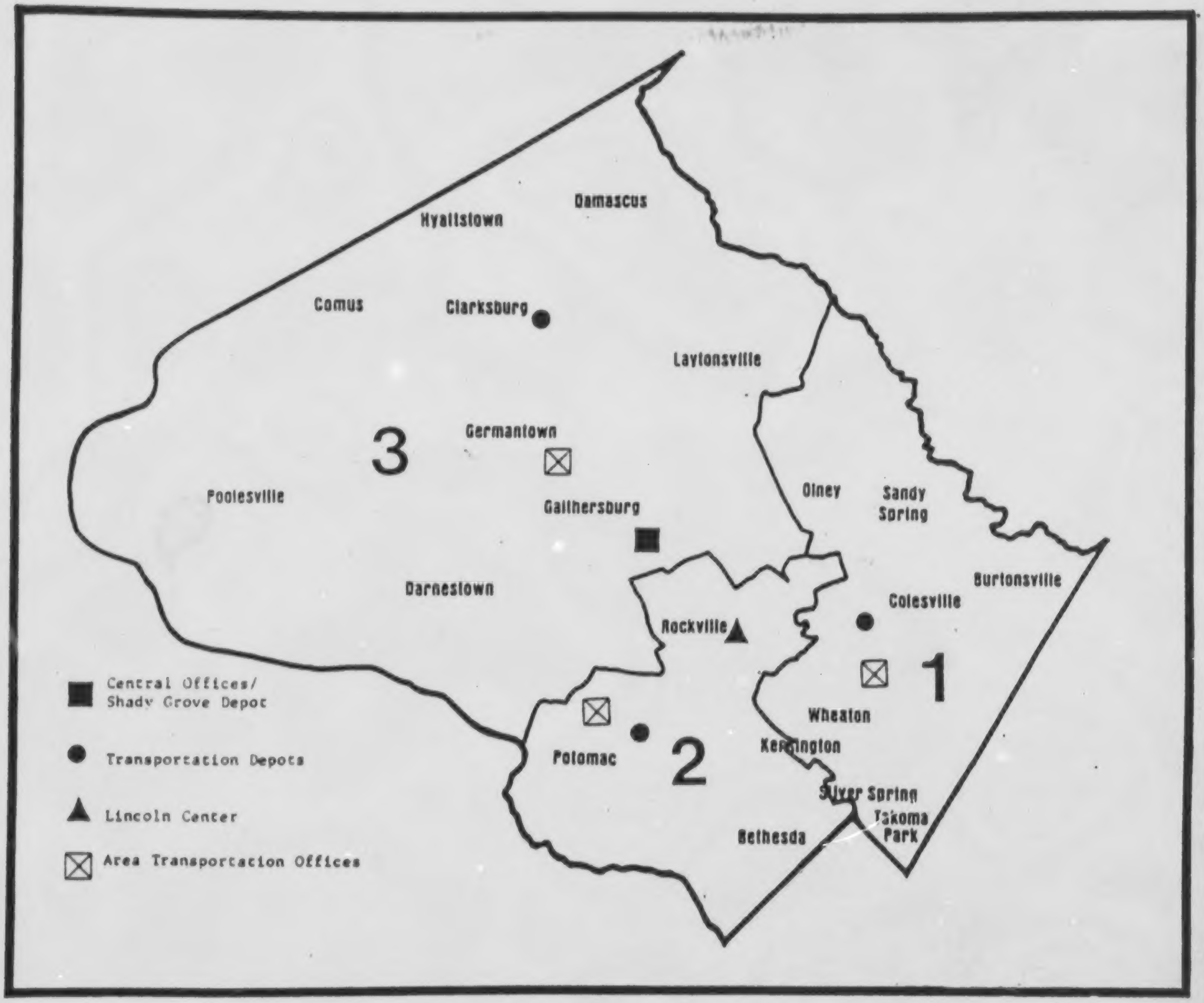
a = Area administrative offices

d = Depots, i.e. automotive depots at Shady Grove, Clarksburg, Randolph, and Bethesda

ad = Area and depot, i.e. assigned to area transportation office, but work out of automotive depots

Exhibit 2.2

LOCATION OF TRANSPORTATION DIVISION CENTRAL OFFICES, DEPOTS AND AREA OFFICES


Hyattstown
Damascus
Comus
Clarksburg
Laytonsville
3
Germantown
Poolesville
Gaithersburg
Olney
Sandy Spring
Burtonsville
Darnestown
Rockville
Colesville
1
Wheaton
Potomac
2
Kensington
Silver Spring
Takoma Park
Bethesda
■ Central Offices/ Shady Grove Depot
● Transportation Depots
▲ Lincoln Center
☒ Area Transportation Offices

Maintenance and Repair

The supervisor of automotive maintenance, a central office staff member, is responsible for all garage operations. A supervising automotive mechanic is in charge of each depot. Supervising mechanics are on duty during the day. Night shift supervisors are lead automotive mechanics who report to the supervising autmotive mechanics in charge of the depots.

The Shady Grove depot is the "main" or central garage. All parts and supplies are ordered through and distributed from Shady Grove. Major jobs like engine replacement and others which require heavy or highly specialized equipment are done there for all other depots. In addition, the central garage is responsible for service on vehicles assigned to its parking lot.[1]

Periodic maintenance and repair of vehicles assigned to their lots are performed at the Clarksburg, Randolph, and Bethesda depots. Each depot, (except Clarksburg) has a tow truck and at least one other service vehicle to send on road calls in its geographic area. The Bethesda depot handles all road calls for MCPS buses that are on field trips in the District of Columbia.

Pupil Transportation

Area transportation offices, under the direction of an area transportation supervisor, are housed at the three school administrative area offices. It should be noted in Exhibit 2.1 that the area transportation supervisors report directly to the director of the division, not to a mid-level manager or supervisor.[2] The area transportation staff are responsible for all pupil transportation in their area, including special education transportation (except private transportation and buses to some supplementary centers). The staff are also, of course, responsible for assigning, dispatching, and supervising all bus drivers and aides in their area.

Though drivers and aides are assigned to area transportation offices, they report to work at the transportation depots where their buses are parked. The depot to which a bus is assigned, however, may not correspond to the administrative area to which the driver is assigned and in which the driver's

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[1] The establishment of large parking lots at each depot was an important part of the decentralization plan.

[2] As of the time this description is written. The Board of Education has, however, received a proposal to create a mid-level position.

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route is located. Thus area transportation supervisors and assistants do not have direct contact with the drivers and aides they supervise, not even through a dispatcher.[3] Limited numbers of "radio drivers"--experienced drivers with radio equipped buses--are assigned to area offices. These drivers can transmit messages between area offices and drivers. However, radio drivers also serve as substitute drivers or respond to road emergencies. They are therefore not always a direct link between area offices and drivers, and, in addition, they have no supervisory authority.[4]

Staffing Trends

Exhibit 2.3 shows staffing trends in the Division of Transportation from FY 1975 to FY 1982 by position category and number of staff members; it also shows increases or decreases expressed as a percentage of the staff in the base year FY 1975 (FY 1975 = 100 percent). There have been increases in three categories of staff: maintenance and mechanical, drivers, and bus attendants (aides). These increases are attributed by the Division of Transportation staff to the closing of schools, the institution of new programs that require transportation, and the enormous growth of special education. As the number of services increased, there was need for more buses, which had to be driven more miles. Thus more drivers and aides were needed. Since buses were used more, they needed more maintenance. In turn, this led to an increase in the need for mechanics.

One trend is particularly striking. The number of administrative, supervisory, and technical staff has decreased over the years by 17 percent; the staff is now only 83 percent of what it was in FY 1975. The number of clerical workers has decreased by 15 percent, and the clerical staff is now only 85 percent of what it was in FY 1975. During the same time, the maintenance and mechanical staff has increased to 151 percent of FY 1975 staffing, the number of drivers to 116 percent, and the number of bus attendants to 213 percent of FY 1975 levels. Obviously, fewer administrative, supervisory, and clerical staff members are now responsible for more drivers, aides, and mechanics than in FY 1975.

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[3] Note in Exhibit 2.1 that the position of dispatcher does not exist. See Part II for further discussion.

[4] The previously mentioned proposal to the Board of Education recommends that radio drivers be elevated in rank to supervisors.

Exhibit 2.3

TRENDS IN TRANSPORTATION DIVISION STAFFING FROM FY 1975 TO FY 1981 AND THE CHANGE AS A PERCENTAGE OF FY 1975 STAFFING

Category	FY 1975	[a]	FY 1976		FY 1977		FY 1978		FY 1979		FY 1980		FY 1981		FY 1982	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Administrative, Supervisory, Technical	23	100	23	100	23	100	22	96	23	100	23	100	20	87	19	83
Clerical	13	100	13	100	13	100	12	92	12	92	12	92	12	92	11	85
Maintenance & Mechanical	49	100	57	116	57	116	63	128	64	131	69	141	71	145	74	151
Bus Operators (Drivers)[b]	358	100	365	102	375	105	380	106	393	110	398	111	406	113	414	116
Bus Attendants[c]	48	100	48	100	52	108	67	139	80	167	84	175	92	192	102	213
TOTALS	491	100	506	103	520	106	544	111	572	116	586	119	601	122	620	126

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[a] All percentages are based on the number of employees in the Transportation Division in the base year FY 1975. Thus in each category the number of staff members in FY 1975 = 100%. Less than 100 = decline from FY 1975.

[b] Bus operator positions are full-time-equivalent positions, not the actual number of drivers employed. Most of the drivers are not employed full time.

[c] Bus attendant positions are also full-time-equivalent positions, not the actual number of aides employed.

It is curious to note that up to FY 1977, when decentralization of the division was begun, there had been no great disparity in the growth of staff by position category except in maintenance. With decentralization, a small area office staff became responsible for all buses, drivers, and aides in the area--too many to supervise and control adequately. Staff members pointed this out in a memorandum, but no action was taken to alleviate their situation. In FY 1982, the five areas were merged into three, and the size of each area increased. While more staff members were assigned to each area office, they became responsible for more schools, pupils, routes, buses, drivers, and aides. Thus their ability to manage, supervise, and support drivers and aides and to meet the demands of the schools was diminished even further.

CHAPTER 3

THE DIVISION'S BUDGET

The budget is intended to support the division in carrying out its mission, and the way the funds are distributed (salaries, supplies, etc.) has an effect on how the division has to operate. There are some indications that in the future, the division may have to change its traditional way of doing business. There are also indications that MCPS will have to be prepared to provide greater support to the Transportation Division.

Budget Trends

Exhibit 3.1 gives the history of the total Transportation Division budget and of some major budget categories from FY 1975 to FY 1982. Shown in the exhibit by fiscal year are actual expenditures (except for FY 1982), expenditures corrected for inflation by the CPI and expressed in 1975 dollars, change expressed as a percentage of the FY 1975 budget, and the percentage of the budget funded by the Maryland State Department of Education (MSDE).

Total Budget

The total budget has increased continuously from $6.8 million in FY 1975 to $14 million in FY 1981, apparently more than doubling in the seven-year period. When corrected for inflation, however, the increase in 1975 dollars was from $6.8 million in FY 1975 to $8.5 million in FY 1981, a change of 25 percent (or 125 percent of the FY 1975 budget). Since the percentage of the budget funded by MSDE is an important topic in its own right, it will be discussed later in some detail.

Salaries

Salaries changed very little from FY 1975 to FY 1981 and, relative to the increase in the total budget, almost not at all after FY 1977. The actual increase was from $4.5 million in FY 1975 to $8 million in FY 1981. In 1975 dollars, however, the increase was from $4.5 million to $4.9 million, and the FY 1981 salary budget was only 109 percent of the FY 1975 budget. In contrast, the total budget increased to 107 percent of the FY 1975 budget by FY 1977 to 112 percent in FY 1978.

This small increase in salaries has been achieved, as has been noted previously, by reducing the managerial, supervisory, and clerical staff while increasing the number of drivers, aides, and mechanics for whom they are responsible. As a result, managers have limited opportunity to manage and supervisors are not able to supervise (see discussion in Chapter 5, which deals with the internal functioning of the division).

Supplies, Materials, and Equipment

The supplies and materials budget has increased more than the total budget. In actual dollars, it has tripled between FY 1975 and FY 1981 and has increased to 173 percent of the FY 1975 budget. Buses represent the largest part of the equipment budget, which increased to 157 percent of the FY 1975 budget between FY 1975 and FY 1981. An increase in programs and the growth of special education have undoubtedly increased the need for buses. However, it is possible that some routing and scheduling problems have been solved in the past by adding buses instead of redesigning routes. This has not much affected the budget, because MSDE has funded the purchase of buses for approved new routes. However, the situation is changing because MSDE has changed its method of funding.

MSDE Funding

As can be seen in Exhibit 3.1, a significant proportion of the division's budget was, in the past, funded by MSDE. Between FY 1975 and FY 1981, the percentage ranged from 60 percent to as much as 76 percent, with an average between 65-70 percent.[1] The funding formula was complex, taking into

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[1] It should be noted that the 67 percent shown for FY 1982 is based on the amount budgeted, not on the amount actually spent, which is not yet computable. The percentage will undoubtedly turn out to be a smaller proportion of actual spending.

Exhibit 3.1

TRANSPORTATION DIVISION BUDGET: FY 1975 TO FY 1982 IN MILLIONS OF DOLLARS AND CORRECTED FOR INFLATION

Fiscal Year	Actual[a] Expenditure	In 1975[b] Dollars	Percentage of FY 1975 Budget	Percentage[c] Funded by MSDE
		Total Budget		
1975	6.8	6.8	100	76
1976	7.8	7.3	107	63
1977	8.2	7.3	107	68
1978	9.1	7.6	112	68
1979	10.0	7.5	110	66
1980	11.7	8.0	118	68
1981	14.0	8.5	125	60
1982 (budgeted)	14.8	d	d	67[e]
		Salaries		
1975	4.5	4.5	100	f
1981	8.0	4.9	109	
1982 (budgeted)	8.9	d	d	
		Supplies and Materials		
1975	1.1	1.1	100	
1981	3.3	1.9	173	
1982 (budgeted)	3.2	d	d	
		Equipment (Primarily Buses)		
1975	0.7	0.7	100	
1981	1.7	1.1	157	
1982 (budgeted)	1.7	d	d	

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[a] Actual expenditure in millions of dollars rounded to nearest 100 thousand.

[b] In millions rounded to nearest 100 thousand and corrected for inflation.

[c] Percentage funded by Maryland State Department of Education (MSDE).

[d] The CPI is not yet available, and correction for inflation cannot be made.

[e] Of the amount budgeted, not of actual expenditure. Actual percentage will be lower.

[f] Not applicable. MSDE does not fund in this way.

Exhibit 3.2

PREDICTED TRANSPORTATION BUDGETS AND MSDE FUNDING FOR SEVEN YEARS

Fiscal Year	1982	1983	1984	1985	1986	1987	1988
Transportation Div.[a] in Millions of Dollars	14.8	16.5	18.5	20.8	23.2	26.0	29.2
MSDE Contribution in[b] Millions of Dollars	9.9	10.6	11.5	12.4	13.4	14.5	15.6
MSDE Contribution as Percentage of Transportation Division Budget	67%	64%	62%	60%	58%	56%	53%

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[a] Predicted Transportation Division budgets based on an annual increase of 12%, which has been the average from FY 1975 to FY 1982.

[b] Predicted MSDE contribution based on the assumption that the maximum allowable 8% increase will be allowed each year.

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account such things as the number of approved routes, miles travelled by buses, staff positions considered essential, and so on. It did not allow for some expenses like substitutes' salaries, so it was not intended that MSDE funding would ever account for 100 percent of the division's budget.

Beginning in FY 1982, the method of funding was changed, and MSDE now gives block grants. The amount given to MCPS for FY 1982 was determined by past expenditures to which an increment was added. In the future, the increase allowed by MSDE will be either 8 percent or the increase in the Baltimore CPI for private transportation, whichever is lower. This means that 8 percent is the maximum increase which can be expected.

Exhibit 3.2 shows that the percentage of the budget that will be funded by MSDE may decrease, leaving more and more funding to MCPS. The predictions are based on two assumptions. First, since the average annual increase in the division's budget has been 12 percent, it is assumed that costs will continue to grow at that rate. Second, it is assumed that MSDE will increase its funding by the maximum of 8 percent per year allowed by the new formula.

As can be seen, if these two assumptions hold true, by 1985 the proportion of the budget funded by MSDE would fall to 60 percent. By 1988, it would fall to 53 percent, and MCPS would have to fund almost 50 percent of the Transportation Division budget instead of the average of about 30 percent it has had to fund in the past. At 50 percent, MCPS would, in 1988, have to fund $14.6 million of the projected $29.2 million budget instead of $8.8 million (at 30 percent), a difference of $5.8 million.

Of course, the rate of inflation may decrease nationally, and the Transportation Division's budget may not continue to increase by 12 percent a year. However, the 60 percent MSDE funding actually occurred in FY 1981 and could occur again in FY 1982. Should that happen, the 50:50 point would be reached well before 1988. Whatever the case, it is highly unlikely that the block grant system adopted by MSDE will provide MCPS with the rather high percentage of funding of the past. This may force both the Transportation Division and MCPS to look for new, less costly ways to carry out the division's mission.

CHAPTER 4

THE DIVISION'S PERFORMANCE

Above all else, the Transportation Division carries out its mission successfully--not necessarily cost effectively, but successfully. The staff get pupils from home to school and back home again day after day for 185 days, often under the most difficult and hazardous driving conditions. They also keep the buses running while keeping all other MCPS' vehicles running as well. The division satisfies parents, principals, its own drivers, and managers of other units.

Pupil Transportation

Exhibit 4.1 shows some selected questions asked on questionnaires (see Appendix A) and responses given by principals and parents. When asked to give an overall evaluation of the bus service, 89 percent of the parents said they are satisfied or very satisfied, and 84 percent of the principals said the service is good to excellent.

Of major concern to parents are the safety of the bus stop, whether or not the bus adheres to a regular schedule, the driver's treatment of the pupils, and driving safety. It can be seen in Exhibit 3.1 that 93 percent of the parents said the bus stop is safe, 93-95 percent said the bus arrives at the stop on time, 82 percent said the driver is courteous, and 79 percent said the driver drives carefully. It should be noted that parents are not always in a position to know whether the driver is courteous or safe, so many of them said they could not judge the situation. It is this, rather than negative responses, that accounts for what could appear as a lower degree of satisfaction.

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Exhibit 4.1

EVALUATION OF THE SERVICES PROVIDED[a] BY THE TRANSPORTATION DIVISION

Questions/Ratings	Respondents	Response	Percentage of Respondents[b]
Overall evaluation of the bus service	Principals	Excellent Good	34 50 84
Satisfaction with the typical home-school-home bus service	Parents	Very satisfied Satisfied	48 41 89
Is child's bus stop located in safe place?		Yes	93
Does child's bus usually arrive on time or within 10 minutes of schedule:			
On way to school?		Yes	93
On way home?		Yes	95
Is driver courteous to pupils?		Yes	82[c]
Does the driver drive carefully?		Yes	79[c]
Time it takes for the shop to complete average mechanical repair	Bus Drivers	Within 1 day Within 2 days	69 18 87
Is mechanical work usually done right the first time?		Yes, always Usually	33 34 67[c]
Drivers' evaluations of condition of bus (see text)		Average rating	1.2

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[a] Data from questionnaires. See Appendix A.

[b] Percentage of those who returned questionnaires. Large sample sizes or large percentages of response from small populations permit generalization to the entire populations represented. Percentages given here do not equal 100 percent because other responses, including "cannot judge" were possible but not reported.

[c] In these cases there was a high percentage of "cannot judge" responses, not of negative responses. Drivers are not always in a position to know whether or not a particular mechanical repair has been done correctly.

Many respondents in both groups took the time to write highly favorable comments on questionnaires. The following are examples:

- "We are very happy with the transportation system." (Parents of a visually impaired child.)
- "I just want to say that...I have been pleased with MCPS' transportation. Keep up the good work." (Parent)
- "The bus services has been outstanding! Congratulations on a job well done!" (Parent)
- "It is my pleasure to help [by filling out this questionnaire] considering how wonderful your bus service has been." (Parent)
- "In no uncertain terms, I think our transportation [system is] excellent! I've had nothing but immediate and effective support from the area director of transportation." (Principal)
- "In [our area, the transportation supervisor] and his staff knock themselves out for us....Transportation is a big undertaking, and the support we get is excellent." (Principal)
- "We have excellent bus service. The supervisor, drivers, and aides are very conscientious and great with the kids." (Principal)
- "[The bus service]....has been excellent. The buses arrive and depart promptly and the bus drivers themselves are very courteous. We are very pleased." (Principal)
- "[With] all of the problems....the Transportation Division does a remarkable job. I admire them all for the job they do." (Principal)

Service and Maintenance

Drivers were asked to evaluate the condition of each of the 20 major components of their buses: window glass, mirrors, starter system, brakes, tires, body, lights, engine, and so on. The rating scale was as follows:

1.	Good	Works well, not broken or torn, no repair or replacement needed
2.	Fair	Works, not broken or torn, needs some adjustment or repair
3.	Poor	Doesn't work at all, broken or torn, in need of replacement or repair

Taking all of these ratings together and making the not unreasonable assumption that an evaluation of all major components constitutes an evaluation of the bus, the average rating of the condition of the buses was 1.2, or good as defined by the above scale. According to a majority of the drivers (Exhibit 4.1), the typical mechanical repair is completed within a day, and 87 percent said the work is done within 1-2 days. Though drivers are not always able to judge whether or not a particular repair has been done correctly, 67 percent did say that the mechanical work is usually done right the first time the bus is taken into the shop.

Managers of the Supply Division, whose vehicles are maintained by the Transportation Division, were interviewed. Managers reported that the Transportation Division provides excellent service, and this favorable evaluation was repeated throughout the interview. The Supply Division has a preventive maintenance schedule for its vehicles and a dispatcher who makes sure vehicles are taken to the shop when scheduled. Unscheduled repairs are done when drivers report the need. Managers said that the Transportation Division adheres to the preventive maintenance schedule and gives fast and competent repair service. It was pointed out that Supply Division vehicles need road service only infrequently, a situation attributed to the excellent routine maintenance the vehicles are given.

Maintenance Division and Transportation Division staff are housed at the same depots, and Maintenance vehicles are parked on depot lots. Maintenance Divison managers report that given these circumstances it is not surprising that there are excellent relations between divisions. Unlike the Supply Division, the Maintenance Division does not have a dispatcher who is responsible for getting vehicles into the shop for preventive maintenance. However, the Transportation Division takes all responsibility for scheduling and performing the service. The depot supervising automotive mechanic develops a monthly schedule, which is posted in his office. Night shift mechanics (except at Clarksburg, where work is done during the day) are assigned to service Maintenance vehicles just as they are assigned other regular work.[1]

Problems and the Overall Evaluation

As might be suspected, there are many problems in the operation of the Transportation Division and the division's delivery of service, and much of the rest of this report is a discussion of those problems. Parents are not always informed of bus schedules. Buses are sometimes late and sometimes break down on the way to school with a full complement of kindergarten tots aboard. Teachers may, on occasion, have to stay beyond their alloted time at the end of the day to care for pupils whose bus has failed to arrive. Wheelchair lifts sometimes freeze. A bus may have to be kept out of service for weeks for lack of a spare part.

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[1] See Part III. A system needs to be devised to inform the Maintenance Division that the work has been performed.

On the questionnaires, principals and parents identified a variety of problems. In fact, almost 24 percent of the parents reported that they had contacted the Transportation Divison for help with a problem at least once. However, all but a handful said the problem was solved by the division's staff within a very short time with courtesy and concern for the parents' and children's welfare.

It is important to note that when asked to evaluate the overall service performed by the division, even the principals and parents who identified problems gave the division high ratings. The problems, then, are problems of detail which do not detract from the generally excellent service provided by the Transportation Division.

CHAPTER 5

INTERNAL FUNCTIONING OF THE DIVISION: RESPONDING VS. PLANNING AND CONTROLLING

While the Transportation Division performs its mission successfully, it does so almost entirely by responding to immediate demands. The pupil transportation staff are inundated daily by so many telephone calls and requests for service that they cannot perform many of the jobs for which they are responsible (see Chapter 12). The automotive services staff meet an enormous demand for service, often with inadequate facilities and equipment (see Chapter 19). Under present circumstances it is difficult to determine how much of the roughly $14-million MCPS spends on pupil transportation and vehicle maintenance is well spent or how much could be saved by making changes in operations. It can probably be assumed, however, that savings are possible. For example, cutting one single mile a day from the combined runs of each bus would reduce annual mileage by 116,000 miles. This, in turn, would save more than $33,000 in fuel alone, to say nothing of reducing maintenance costs. However, the staff have almost no time to acquire the information needed to plan routes with maximum efficiency and, even if the information were readily available, there is little time to analyze it. There is time only to respond, to meet the demands of the day, the hour, the minute. There are many reasons for this unfortunate situation, many of which are presently beyond the control of the division.

The Causes

Changes in the Road Network

The widening of a road somewhere in the county would go unnoticed by the other service units in MCPS, except, perhaps, as a modest inconvenience to some maintenance mechanics or drivers of supply and food service vehicles. In any case, those division would not be affected. However, while the work on the road is going on, the Transportation Division may have to reroute and

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reschedule a number of buses. If, when the work is finished, the newly widened road carries a heavier load of traffic than before, the division's may have to pick up 200 additional children who, because walking is no longer safe, become eligible for transportation under current laws. Picking up additional children also means establishing bus stops, routes, and schedules and, perhaps, buying a new bus or two and training drivers.

Pupil Mobility

Population movement within and in and out of the county is high and frequent, and some schools experience as much as 30-40 percent mobility rate among pupils. If the number of pupils remains fairly constant through the school year, this movement will not affect the number of calls the Maintenance Division has to make, the number of meals served in school cafeterias, or the number of suplies delivered to schools. Again, however, movement of the population forces the Transportation Division to make frequent modifications of bus routes and schedules.

Special Education

Special education transportation places heavy demands on the Division of Transportation. In 1981, only 6 percent of the pupils who were transported were in special education programs, but they accounted for 30 percent of all buses and of all route mileage. Since there are many programs widely scattered over the county, special education pupils must often be transported very long distances or by extremely complex routes. In addition, families of pupils in special education are as mobile as other families. Often, when a family moves, the child continues to attend the same program or school as before rather than transferring to the neighborhood school in the new community. Thus, one child's moving may mean that the Transportation Division staff will have to quickly work out a way for the school bus to get the child to the program--no matter how far from the child's new home--or make immediate arrangements for private transportation.

Parents

Parents make daily demands upon the Transportation Division, as might be expected when 50,000 children are transported. Most sound reasonable at first glance: "Could the bus driver please come just two extra blocks to our house because...? It will take only two minutes--we've timed it." But 2 minutes for each of 50,000 children would mean that 1,666 hours would be added to the schedule each school day. While the division cannot possibly grant all such requests, the staff must respond in some way to each parent, and this takes an enormous amount of time each day.

The Schools

The division responds daily to requests for service from area associate superintendents, principals, teachers, and program coordinators. The area office may, for example, arrange for half-day closing of schools, an apparently simple arrangement which actually imposes a major burden on the Division of Transportation: getting drivers for what amount to extra runs, working out conflicts in bus schedules so that schools which are not closed are provided with normal after-school service. Each day, many teachers take pupils on field trips. Program coordinators or subject specialists conduct activities which may involve transporting bands, glee clubs, or other large groups of pupils from place to place. In all cases, arrangments for transportation have to be made by the division's staff.

Providing Daily Service

In addition to external demands, the daily operation of the bus and garage services imposes a need for immediate response. Many drivers are absent every day, and substitutes have to be called. Buses break down on the road, and sometimes both an extra bus and an emergency vehicle have to be dispatched. Gasoline has to be pumped, parts ordered. In short, all of the ongoing tasks have to be done at the same time the staff try to respond to the demands of road conditions, weather, parents, teachers, etc.

The Effects

Pupil Transportation

In pupil transportation, most of the responses the staff must make to immediate demands require telephone or radio calls, sometimes both, and often many calls for one task. A time-and-task study conducted by the project staff showed that for all area transportation office staff combined, talking on the telephone absorbed about 45 percent of their time on the job, nearly half of a normal working day.[1] Transportation assistant spent about 68 percent of the day (about 5 hours) on the telephone. They also spent about two hours a day making radio calls, managing field trips, and doing other assorted jobs. One hour a day was available for anything that could be called planning--and that hour was likely to be devoted to modifying already existing routes, totting up load counts, and other short-range jobs.

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[1] See detailed discussion in Part II and Appendix A.

While area transportation supervisors were not asked to participate in the time-and-task survey, observations by the project staff showed that they too spend a large part of their time on the telephone or dealing with immediate, not long range problems. In some cases, they have so little time during the normal work day to deal with problems that will affect operations that they conduct field investigations on their own time (checking new housing, checking bus stops, etc.).

The overwhelming, constant demand for service makes it impossible for pupil transportation supervisors and transportation assistants to supervise. They do not have time to go out on the road. They cannot give drivers the on-the-bus supervision required by law, by-law, or regulation. Even less do they have an opportunity to plan and to control the conditions of operation. As was said previously, they do not have time to acquire the information needed to plan routes, and even if it were available, there would be no time to analyze it. There is no time to take a long look at the existing network of routes to see if it could be made more efficient.

Service and Maintenance

The service and maintenance staff fare somewhat better. They do not receive the same barrage of calls from parents, teachers, principals, area superintendents, and other MCPS staff members. However, they too spend virtually all of their time responding. Depot supervisors spend 50 percent or more of their time writing repair orders because they are not assigned a service writer and doing the depot clerical work because they have no clerk. In addition, they take emergency calls for road service on both the telephone and the radio. They are able to spend less than the remaining 50 percent of their time supervising because they are too frequently interrupted. At some depots, the mechanics and service workers are forced to work on parking lots--usually on their backs--in sun, rain, or snow because there are too few service bays for the number of buses assigned to the depot and the number of jobs that have to be done each working day and night.

PART II

PUPIL TRANSPORTATION

CHAPTER 6

SERVICES AND THE BUDGET

Major Trends

General Trends

Exhibit 6.1 shows some general trends in MCPS school bus transportation from FY 1975 to FY 1982. Exhibit 6.2 shows, in abbreviated form, these same trends as percentages of increase or decrease from either the peak year of the period or of the lowest year, whichever comparison is appropriate.

The number of pupils enrolled and the number of MCPS schools in operation have declined steadily from FY 1976 to the present. While the number of schools decreased by 13 percent, enrollment decreased by 23 percent. The number of MCPS pupils transported on home-school-home runs decreased by 21 percent, slightly less than the decrease in enrollment, but certainly closely in keeping with it. Throughout the entire period from FY 1975 to FY 1982, the percentage of pupils eligible for transportation varied between a low of 47 percent to a high of 53 percent.

The most striking trend which can be seen in both exhibits is the increase in the number of buses and in the number of miles travelled by the buses.[1] Whereas there were, in FY 1975 and FY 1976, 526 buses on routes, there are now 614, an increase of 17 percent. In FY 1975, the buses travelled 7.95 million miles. In FY 1981, they travelled 9.82 million miles, an increase of 24 percent. Thus while the number of pupils eligible for transportation decreased by more than 9,000 (or 21 percent), the burden on the Transportation Division increased by 88 buses (to 117 percent of FY 1975) and by almost 2,000,000 more fleet miles (to 124 percent of FY 1975). Despite this growth,

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[1] Total miles, not home-school-home route miles only. The total includes all uses of the buses: route miles, field trips, special runs of all kind, etc.

Exhibit 6.1

MAJOR TRENDS IN TRANSPORTATION: FISCAL YEAR 1975 to 1982

	1975	1976	1977	1978	1979	1980	1981	1982
Number of Schools in Operation	202	205	199	191	186	185	181	178
MCPS Enrollment (in thousands)	124.3	122.3	117.6	112.6	107.4	102.5	97.1	95.6
MCPS Pupils Transported (in thousands)	60.3	64.3	57.2	53.4	52.0	49.0	50.9	51.0
MCPS Pupils Transported as Percent of Enrollment	48	53	49	47	48	48	52	53
Number of Buses on Route	526	526	539	565	572	586	602	614
Number of Miles Travelled (millions)	7.95	7.88	8.00	8.37	8.90	9.44	9.82	N/A

Exhibit 6.2

FY 1981 AND FY 1982 DATA AS A PERCENTAGE OF INCREASE OR DECREASE FROM PEAK OR LOWEST YEAR

		Percentage	
	Base Year[a]	FY 1981	FY 1982
Number of Schools in Operation	FY 1976	-12	-13
MCPS Enrollment	FY 1975	-22	-23
Number of Pupils Transported	FY 1976	-21	-21
Number of Pupils Transported as Percentage of Enrollment	FY 1976	NC[b]	NC
Number of Buses on Routes	FY 1975	+14	+17
Number of Miles Travelled by School Buses	FY 1975	+24	NA[c]

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[a] See Exhibit 6.1. Enrollment began to decline in FY 1976. However, the number of schools in operation rose from 202 in FY 1975 to 205 in FY 1976. The number of pupils transported in absolute numbers and as a percentage of enrollment also increased. However, the number of buses remained constant in FY 1975 to FY 1976, but then began to increase.

[b] NC = No change. The highest in the past was 53 percent in FY 1976. In FY 1981, the percentage was 52 and in FY 1983, 53. See Exhibit 6.1

[c] NA = Not available. Mileage data will not be computed for FY 1982 until the autumn.

the managerial and supervisory staff of the Transportation Division (Chapter 2, Exhibit 2.2) has been cut to 83 percent of its FY 1975 level, while the clerical staff has been cut to 85 percent.

Regular and Special Education[2]

The two largest categories of service are regular and special education. Exhibit 6.3 shows comparative trends in these services from FY 1975 to the present. Exhibit 6.4 shows percentages of change compared to a base year, either the peak or lowest year, depending on the nature of the comparison.

From FY 1976 to the present, the number of regular pupils transported has declined steadily, so that in FY 1982, 23 percent fewer regular education pupils were being transported than in FY 1976. The number of buses assigned to regular runs has decreased by 6 percent, and the mileage attributable to regular buses had declined by 4 percent (approximately in keeping with the decrease in number of buses). In contrast, the number of special education pupils transported on special buses has increased by 67 percent over FY 1977, the lowest year. Since FY 1975 (lowest year), the number of special education buses has increased by 140 percent, and the mileage attributable to special education buses has increased by 168 percent, far beyond the increase in the number of buses.

In actual dollars (Exhibit 6.3), all per-pupil maintenance, operations, and salary costs increased. For regular pupils, the per-pupil costs of maintenance and operations (fuel, service, repairs) increased by 246 percent from FY 1975 to FY 1981, and operator salary costs increased by 50 percent from FY 1976 (low year) to FY 1981. For special education pupils, maintenance and operations costs increased by 279 percent from FY 1975 to FY 1981. Aides' salaries are included as operator salary costs for special education pupils, so that the per-pupil operator costs increased by 169 percent between FY 1975 and FY 1981.

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[2] It is both badly misleading and very awkward to refer to the vast majority of pupils who are not handicapped or who do not receive special services as "non-special-education" pupils. Therefore, and for consistency, they will be referred to throughout this report as regular pupils, and their schools and programs will be called regular schools and programs.

Exhibit 6.3

A COMPARISON OF TRENDS IN REGULAR AND SPECIAL EDUCATION FISCAL YEAR 1975 to 1982

	1975	1976	1977	1978	1979	1980	1981	1982
Number of Pupils Transported in Thousands:								
Regular Program	58.3	62.4	55.3	51.1	49.2	46.5	47.9	47.8
Special Education Program	2.0	2.0	1.8	2.3	2.8	2.5	3.0	3.1
Total	60.3	64.4	57.1	53.4	52.0	49.0	50.9	50.9
Number of Buses on Routes:								
Regular Program	444	432	424	409	409	404	420	417
Special Education Program	82	94	115	156	163	182	182	197
Total	526	526	539	565	572	586	602	614
Miles Travelled in Millions:								
Regular Program	6.7	6.4	6.2	5.8	6.4	7.0	6.4	NA
Special Education Progam	1.3	1.4	1.8	2.6	2.5	2.4	3.5	NA
Total	8.0	7.8	8.0	8.4	8.9	9.4	9.9	NA
Maintenance and Operation Costs Per Pupil:[b]								
Regular Program	$ 24	$ 27	$ 31	$ 37	$ 49	$ 69	$ 83	NA
Special Education Program	$101	$135	$189	$243	$218	$286	$383	NA
Operator's Salary Cost Per Pupil:								
Regular Program	$ 39	$ 38	$ 42	$ 45	$ 54	$ 60	$ 57	NA
Special Education Program (includes aides)	$342	$393	$545	$629	$573	$566	$698	NA

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[a] NA = Not available. Mileage and cost data will not be computed for FY 1982 until the autumn.

[b] Maintenance and operations costs include parts, labor, contract work, gas, oil, tires, indirect labor, and overhead.

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Exhibit 6.4

REGULAR AND SPECIAL EDUCATION DATA AS PERCENTAGES OF INCREASE OR DECREASE FROM BASE YEAR

		Percentage	
	Base Year[a]	FY 1981	FY 1982
MAINTENANCE AND OPERATION COSTS PER PUPIL			
Regular Education	FY 1975	+246	NA
Special Education	FY 1975	+279	NA
OPERATOR'S SALARY COST PER PUPIL			
Regular Education	FY 1976	+ 50	NA
Special Education	FY 1975	+104	
NUMBER OF PUPILS TRANSPORTED[b]			
Regular Education	FY 1976	-23	-23
Special Education	FY 1977	+67	+72
NUMBER OF BUSES ON ROUTES[c]			
Regular Education	FY 1975	- 5	- 6
Special Education	FY 1975	+122	+140
MILES TRAVELLED BY BUSES[d]			
Regular Education	FY 1975	- 4	NA[e]
Special Education	FY 1975	+169	NA

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[a] Base year is peak or lowest year, depending on the comparison being made. The use of different base years for number of pupils transported gives the most conservative figures and changes.

[b] Special education pupils include only those transported on special education buses, not the very large number of special education pupils who ride regular buses and are included here in regular pupils.

[c] Special education buses are only those so designated in Transportation Division records. The number is conservative.

[d] Mileage which can be attributed to each of the two classes of bus.

[e] NA = Not available. FY82 data will not be available until autumn.

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Other Programs

Over the years, the number of programs which require transporting pupils by bus has increased. In some cases, special home-school-home transportation is provided. In others, pupils are transported among schools or from schools to program sites. The following are some of these programs:

ESEA Title I
Kingsley Wilderness Project
Extended Elementary Education
Head Start
ESOL
Middle, Junior, Secondary Activities
American Indian Project
Quality Integrated Education

These and other programs contribute to the general increase in transportation costs. Every additional bus mile means additional fuel, maintenance, and driver salary costs. Scheduling buses, arranging for drivers, finding substitute drivers when necessary, and taking care of all the other details which are always involved in moving pupils from place to place also adds a heavy burden to a reduced and already overburdened staff. Even when a program has it own van and service contract, transportation costs to MCPS are increased.

Field Trips

To the Transportation Division, a field trip is any trip which can be charged to some account: school, administrative area, program, or MCPS office account. Therefore, when pupils are transported for some of the programs mentioned above, the trip is recorded and charged as a field trip. However, the Transportation Division is often required to transport pupils for programs which do not have budgets. Thus field and other special trips are part of a larger problem which is discussed later.

Effect of Closing Schools

It is generally believed that when declining enrollment leads to closing of schools, the number of pupils transported increases.[3] The line of reasoning is that when a school is closed and its pupils are transferred to another school farther from home, more pupils become eligible for transportation.

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[3] A generality often made in the literature of school bus transportation.

This argument has, in the past, been used to justify increases in the Transportation Division budget.[4]

The data presented in Exhibits 6.1, 6.3, and 6.4 do not support the belief that closing schools has increased the total transportation burden in MCPS. It is true that the number of buses and number of miles travelled by buses have increased during the period of declining enrollment and closing of schools. However, as can been seen most easily in Exhibit 6.4, the number of pupils in regular education who are being transported in FY 1982 is 23 percent below the FY 1976 peak, and the number of regular education buses has decreased by 6 percent. In FY 1981, the latest year of record, the number of miles travelled by regular buses was 4 percent lower than the high of FY 1975.

It looks very much as if the increases in the number of buses and the number of miles travelled are primarily attributable to the increase in the number of programs which require transportation and to the growth of special education. New programs require additional service without necessarily making eligible for home-school-home transportation pupils who were not previously eligible. A pupil who is identified as handicapped, however, becomes eligible for home-school-home transportation regardless of distance between home and school. In addition, many special education pupils who are able to ride regular buses are assigned to schools or programs which are farther from their homes than the school they would normally attend. This, of course, increases the distance they are transported.

This does not mean that closing schools has had no effect on transportation. There have probably been particular cases in the past in which the closing of a school has made additional pupils eligible for transportation, though the local increase may actually have been offset by a decrease elsewhere. It is also possible that the time may come when local increases in the number of pupils who become eligible for transportation because of the closing of schools will not be offset by decreases elsewhere.

It is somewhat doubtful that the cost of transporting additional pupils will ever be a major consideration when decisions are made about closing schools, because too many other considerations enter into the decisions. Still, it should be possible in any given case to determine how many additional pupils will have to be transported, how many more miles buses will have to travel, and what transportation costs will be if a school is closed. It has not been possible for the pupil transportation staff to do this, however, because they have not gotten enough information about pupils: who they are, where they live, to what schools they are transferred, etc.

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[4] See for example the FY 1978 budget in which "additional bus operators are requested in anticipation of transporting 2,300 additional pupils when small schools are closed...." However, in response to a 1981 budget question (11, budget page V-60), division managers wrote, "The number of routes created due to school closings cannot be determined...(and) records are not maintained to show that...new routes were established due to school closings."

Services, Decisions, And Costs

Almost daily, the managers and supervisors of the Transportation Division must make costly decisions about the many field trips and other special trips and services they are asked to provide. As was pointed out earlier, some programs have transportation budgets and some do not. On the surface, at least, it would seem as if the division could refuse all requests for pupil transportation unless there is an account or program budget to which the cost of service can be charged. In practice, it does not work that way because there are no guidelines on which decisions can be based.

Gifted and Talented Program: An Example

The gifted and talented program is an excellent example of the problem. It must be remembered that the point here is not to assess the adequacy of the support MCPS gives to the program but to illustrate the effects of budgeting--or, in this case, lack of budgeting--and the lack of guidelines.

The number of programs for the academically gifted and talented is increasing.[5] Some do not require transportation. Some are "pullout from school" programs which do require transportation. Still others are not considered "pullout" programs, but they require transportation nonetheless. Curiously, in the many pages of reports and memoranda available to the MORE project team, there is only one passing reference to transportation, and as far as could be determined, no provisions have been made in recent budgets for the transportation of the gifted and talented either among schools or from schools to other centers.

However, some gifted and talented pupils are being transported. In Area 1, about 300 pupils from 42 different schools are transported to four schools which have programs. Each pupil attends one day a week, though all pupils do not attend on the same day. This requires daily runs that add about 30-35 hours a week to the division's bus schedule. In Area 2, seven schools sent a comparatively small number of gifted and talented pupils to Lone Oak Elementary School for a half-day per week, and one bus was assigned to the program for about 10 hours a week. The Transportation Division absorbs the cost of these special trips. Operating costs for the approximately 45 hours a week that are involved here can be as high as $25,000 a year.

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[5] Sources: (1) Report of the Advisory Committee on the Gifted and Talented, July, 1976, (2) Memorandum, Superintendent to BOE, Annual Progress Report on Education of Gifted and Talented, November, 1981, (3) Memorandum, Superintendent to BOE, Programming for Gifted and Talented, November, 1981.

Quite in contrast to this service is the situation at Burning Tree Elementary School (Area 2), which has a program for the gifted and talented. Parents must provide transportation and if they cannot do so, their child cannot attend the program--in an administrative area in which transportation is already being provided to other gifted and talented pupils.[6]

In Area 3, the predominantly rural area, gifted and talented pupils are not transported among schools. In the spring of 1980-81, a program for the "academically very able" was established at the Germantown campus of Montgomery College. Parents had to provide transportation to the program or the children could not attend. This spring (FY 1982), a mathematics program for the "academically very able" will be offered at the Montgomery Village Junior High School each Friday. Parents will have to provide transportation or their children will not be able to attend.

Again, the point here is that decision making is a problem. There are inequalities in the services offered by the Transportation Division, even in services to the same program and within the same administrative area. Budgeting is also a problem. When the program does not have funds, the Transportation Division absorbs the costs of the service.

Reimbursement And Funding

Partly because the Transportation Division is required to provide so many services to programs with and without budgets, it is difficult and sometimes impossible to determine the transportation costs of specific programs when the need arises. For example, it is reported by the managers of the division that some federally funded programs always overspend their transportation budgets before the end of the school year. The division cannot refuse to transport the pupils who are in the program and must therefore absorb the costs of transporting them in its own budget. This may be very costly to MCPS.

Field Trips

Any trip that can be charged to some account is considered to be a field trip. In some cases, educational programs are charged. In others, field trip costs are passed on to students (parents). In all cases, transportation costs should be recovered by MCPS if charges are properly determined. As matters now stand, the Board of Education establishes a field trip mileage charge which includes a standard amount for maintenance and operation costs, driver's salary, and partial fringe benefit costs. The charges do not include administrative costs despite the fact that arranging field tips takes a considerable amount of area transportation offices' administrative time.[7] The most recent increase in the field trip mileage charge was made effective in April 1981.

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[6] There is some controversy which goes far beyond the issues this report can or should address. The point here is to illustrate the effect of lack of guidelines on decision making.

Exhibit 6.5 shows the cost of field trips to MCPS in FY 1981, allowing for the amount collected or reimbursed on the basis of the Board of Education mileage charge and the amount the service actually cost. Far too low a charge was made (and is still being made) for driver's wages and fringe benefits. Part of the reason for this is that drivers must often be paid overtime wages for field trips, but depending on the period (July 1980 to March 1981 or April to June 1981) the differential between actual wages and the amount charged ranged from $0.59 to $1.84 per hour. For part of FY 1981, too low a charge was made for maintenance and operations. This was changed when the Board revised rates, and there was actually a gain between April and June 1981. However, that very small gain did little to offset the loss to MCPS on field trips, which amounted to $91,516. If administrative costs were included, the loss would undoubtedly exceed $100,000.

The $14,398 "gained" from maintenance and operation charges cannot be taken as an indication of an upward trend that has been brought about by the latest revision of field trip rates. Instead, maintenance and operations costs, driver's salaries, and the cost of fringe benefits will undoubtedly rise far beyond the amount charged for field trips. Thus, unless charges are brought into line with costs and reviewed and adjusted more frequently, losses will continue and will probably increase.

MSDE Funding

It was pointed out in Part I that before FY 1982 MSDE funded as much as 70 percent of the Transportation Division budget. Therefore, MCPS could afford to pay for field trips and other services not funded by MSDE. However, MSDE now provides block grants, and if inflation continues, MCPS will have to assume a greater and greater share of transportation costs (see Part I). It is therefore doubtful that MCPS can continue to afford to fund field trips. In addition, the change in the funding method makes it imperative for MCPS to obtain as much funding or reimbursement as it can from sources other than MSDE.

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[7] It is estimated from a time-task study that in the three administrative areas combined, the time and salary of 1½ transportation assistants are devoted to arranging and managing field trips.

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Exhibit 6.5

FY 1981 FIELD TRIP:
GAIN OR LOSS FROM REIMBURSEMENT

	Loss (-) or Gain (+)
Wages and fringe benefits	- $63,079
Maintenance and operations costs, July 1980 to March 1981	- 42,835
Maintenance and operations costs, April 1981 to June 1981	+ 14,398
TOTAL COST TO MCPS BEYOND REIMBURSEMENT	$91,516[a]

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[a] Does not include Transportation Division administrative costs.

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Driver and Substitute Accounts: A Budgeting Anomaly

The way in which drivers' and substitutes' salaries are budgeted and accounted for is related to the whole problem of attributing transportation costs to specific accounts and obtaining reimbursement. It also determines the number of drivers the Transportation Division is permitted to hire and the amount of time that has to be devoted to divisional payroll accounting.

The Accounts

There is, of course, a budgeted line item for drivers, expressed as the number of full time equivalent (FTE) drivers allowed to the division. In recent years, the number of FTE's has been as follows:

FY	FTE's
FY 1980	386
FY 1981	394
FY 1982	402
FY 1983	520.5

There is also a line item for substitutes' salaries. The amounts budgeted in that account and the amounts actually spent in FY 1980 and FY 1981, the latest years of record, were as follows (rounded to the nearest thousand):

	Budgeted	Amount Spent
FY 1980	$304,000	$668,000
FY 1981	368,000	819,000

The amount budgeted for FY 1982 was $423,000 and for FY 1983, $487,000 (rounded). If FY 1980 and FY 1981 can be used as guides, the average amount actually spent is 2.2 times the amount budgeted. It can be anticipated, then, that the amount spent in the substitute account will be about $930,000 in FY 1982 and $1,071,000 in FY 1983.

While the rate of absenteeism among drivers is high and many substitutes are needed each day, a large and mostly unidentifiable percentage of the substitute account is used to pay regular drivers.[8] In a memorandum

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[8] Unidentifiable, that is, without an inordinate amount of effort. The funds are accounted for, but one would have to go through hundreds of trip tickets to sort out exactly what program or activity was supported by the funds of the Transportation Division. Mostly, they would be programs without transportation budgets--or without Budgets at all.

(October 15, 1981) in which he explained the reasons for certain budget requests, the director of the Division of Transportation pointed out the following:

> In FY 1982, 300 (additional) hours per day are being paid regular drivers for runs being done on a daily basis. In order to include this time in the driver's regularly scheduled hours for which he/she is paid and accrues benefits, 37.5 FTE positions are needed. The drivers are currently being paid out of the substitute salary account.

It might also have been said that the substitute account is the catch-all account to which is charged the salaries of drivers who are assigned the many trips for which the division is not reimbursed. Some of the money in the account is used to pay substitutes.

This curious system of budgeting too low in two places and overspending in one of them has some unfortunate effects. Perhaps most important is that it prevents the division from openly and honestly hiring an adequate number of drivers for an adequate number of hours at a time when the number of buses, miles driven, and trips are at all time highs. It also makes attributing costs to and obtaining reimbursement from programs difficult or impossible. If the transportation budget of a particular program were externally funded, it would make it difficult for MCPS to justify or document increases in costs that might otherwise be reimbursed. The only possible gain is that increases in staff do not appear to exceed some arbitrary guidelines.

The Payroll

The preparation of the payroll is a monstrous task to which far too much time must be devoted. The roughly 400 FTE drivers the division is allowed represent about 600 part-time drivers. Between 60 and 90 drivers are absent each day, and substitutes must be hired for all or part of their runs. Accounting for driver and substitute time is a difficult job in itself. In addition, both drivers and substitutes are assigned a variety of home-school-home runs, extra runs, and special trips. The area transportation staff must record and account for all of these trips and hours, assign time and mileage charges to various programs, and so on. (See Chapter 10.)

Budget Planning

The Division of Transportation collects extensive data from the transportation and maintenance operations. It also collects and supplies data to other units and programs. Some of these data would be useful for planning resource needs. However, under present conditions, they contribute almost nothing to budget planning. The budget which is presented for approval is based primarily on past budgets, not on the needs of the division. A clear example of this is the previous description of the limit placed on the number of drivers allowed in the division's budget despite ample justification for more. Another case in point is that regardless of the increase in the number of buses, in miles driven, or in the number of services provided, the Division of Transporation's managerial, supervisory and clerical staff have been reduced consistently.

Discussion

It should be obvious from the findings presented here that there are contradictions between the demands made on the Transportation Division and the financial realities. An organization faced with declining revenues and the possibility of having to assume an even greater proportion of operating costs should, it would seem, do the following things:

- Reduce the number of costly services it offers
- Keep better records of how funds are spent
- Attempt, whenever possible, to obtain full reimbursement of funds to which it is entitled
- Make it possible for managers to manage by providing appropriate staff, guidelines, and support to managers

Over the past five or six years, MCPS has not only done none of these things, but, for the most part, has done quite the opposite. More, not fewer demands have been made on the Division of Transportation. The division has been discouraged from accounting accurately for funds (e.g., being forced to overspend in the substitute account). Field trip charges, which include charges made to many programs and to pupils, have not covered operating costs. The division has been forced to absorb costs for programs which do not have budgets and for those that regularly overspend. The managerial and supervisory staff have been cut and have little time to devote to the planning that could possibly save MCPS thousands of dollars annually. Many changes must be made if the situation itself is to be changed: changes in attitudes towards services that MCPS can and cannot afford to provide, changes in budgeting and accounting, and changes in the way decisions are made. They cannot be made by the Division of Transportation alone, and many of the things that need to be done--development of policies and procedures that underlie decision making, for example--can be done only at the very highest levels of administration and by the Board of Education.

Recommendations

A single major recommendation emerges from the findings: The superintendent and the Board of Education should establish a task force (team, committee, etc.) to review current transportation policies and to recommend additional policies for the operation of pupil transportation. At a minimum, policies should deal with or provide for the following (in which some MORE recommendations are made):

- Transportation budgets for already existing programs for which transportation is now being provided in whole or in part (e.g., gifted and talented program)
    - The Division of Transportation should, with help of other units if necessary, identify all programs in which pupils are receiving transportation and the division and the program coordinators should make projections for future costs.
    - Transportation budgets should be set up and clearly identified by program.
- Procedures for annual review of all federally and other externally funded programs to determine actual transportation costs and obtain adequate reimbursement
    - The Division of Transportation should identify programs in which the amount budgeted for transportation has typically been inadequate.
    - Transportation budgets of these and other externally funded programs should be reviewed annually before being submitted or approved (see below).
- An orderly procedure for controlling the growth of programs that make additional pupils eligible for transportation or which involve transportation of pupils among schools or from schools to special centers
    - A permanent transportation review team should be formed.
    - A statement of transportation needs and costs should be included in the description and proposed budget of each new program.
    - The transportation review team should review the statements and cost estimates.
    - A statement by the review team should be presented to the Board of Education at the time the program is considered for approval by the Board.

- Limiting the number of field, athletic, and other special trips

- Procedures for the review and revision of field trip charges

  - The Division of Transportation should be charged with the responsibility for reviewing all field trip costs (including administrative) each quarter and for submitting to the superintendent a statement of current costs.

  - The superintendent should review the Division of Transportation's report and submit recommended increases (or decreases) to the Board of Education every quarter.

- Clear and consistent guidelines governing transportation and for granting or refusing transportation

  - Administrators and supervisors of the Division of Transportation should be able to make definite decisions not subject to appeal in all but major and/or unusual cases (to be defined by regulation).

  - In all but major or unusual cases, the director of the Division of Transportation should be the last person to whom an appeal can be made.

  - For major or unusual cases, procedures should specify who can make decisions.

  - All MCPS staff and parents (perhaps on request only) should be provided with a booklet in which rules and procedures are outlined.

- Division of Transportation budget and accounting

  - Driver and substitute accounts should be clearly separated; no amount of money paid to a regular driver should be charged to the substitute account.

  - The number of FTE drivers justified by the Division of Transportation by accurate data should be allowed in the following year's budget.

  - The Division of Transportation, perhaps with the help of other units, should design a system which guarantees that correct transportation costs will be charged to program (and other) budgets.

CHAPTER 7

SPECIAL EDUCATION: A MAJOR SERVICE[1]

The Distribution Of Resources

Ask anyone in the Transportation Division to identify the greatest single problem in pupil transportation and the immediate reply will be something very close to, "Special education; if we could solve that one we would have few other problems." The reason for this assessment is partly explained by the fact that the number of special education pupils, drivers, aides, and miles travelled have increased continuously from FY 1975 to the present (Chapter 6). Mere numbers do not, however, begin to reveal how much of a problem special education is to the Transportation Division.

The general problem is that the 3,000 pupils transported by nearly 200 special education buses absorb a disproportionate share of the division's resources.[2] While they represent only 6 percent of the 50,000 pupils transported, they account for the following:

- 32 percent of all buses in FY 1982
- 100 percent of the bus aides
- 35 percent of all bus miles (FY 1981 data)
- At least 32 percent of drivers' salaries

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[1] For the most part, this chapter will deal with school bus transportation. When private transportation of special education pupils is included in a discussion, that fact will be made clear.

[2] The 3,000 does not include special education pupils who ride regular buses, some of whom are transported to schools farther from home than their neighborhood schools.

There is no way to determine how much of the time of the pupil transportation staff is devoted to special education.[3] However, as was pointed out in Part I, one transportation specialist at the central office already devotes 100 percent of his time to special education, including private transportation of special education pupils. The FY 1983 budget provides for a special and alternative assistant who will also work full time on special education. The specialist has been doing only some, not all of the special education routing and scheduling, and this will still be true when there is an assistant. The largest part is done and will continue to be done by the staff in the area office. This routing and scheduling takes a great deal of time because transporting special education pupils presents some unique problems.

Pupil Mobility And Movement Of Programs

Pupil Mobility

Transportation Division staff members who deal with pupil transportation say that the parents of children in the special education program move around the county more often than the parents of children in the regular program. This may be true, though accurate data to support the generality are not available. What is certain is that when a child who is transported by special education bus moves, the impact on pupil transportation is far greater than when a regular pupil moves, particularly if the child continues to attend the same school or program as in the past. Unlike the regular pupil, the child who rides a special education bus cannot simply go to the nearest school bus stop. Instead, special transportation arrangements have to be made, and this may involve rerouting and rescheduling a bus, assigning a bus that has special equipment, and so on.

Movement of Programs

Sometimes, special education programs are moved while the children attending the program do not change their place of residence. This can create routing and scheduling problems for the Transportation Division and a certain amount of hardship for children as well. For example, in FY 1981, there were four specific learning disability (SLD) classes at Watkins Mill Elementary School. The school day started at 8:15, which allowed the buses to go on other runs to schools that opened at 9:00. This year, three of the SLD classes were moved to Cashell and Candlewood Elementary Schools, which open at 9:00. Three buses had to be added to the routes to accommodate to the new opening time, and the time the children who live upcounty spent on the bus was increased by a half hour.

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[3] The previously mentioned time-task study attempted to determine this. However, as will be discussed later, respondents spent so much time on the telephone and were interrupted so often by phone calls that they were not always able to record the purpose of a particular call. All reports indicate that a large number of calls are about special education.

Again in FY 1981, the Brown Station Elementary School provided special education classes for children living near the school in the Gaithersburg area and also for those living in and around Damascus to the north. This year, the children living nearest to Brown Station were sent to Fallsmead Elementary School, which increased the distance they travelled and the time they spent on the bus. Previously, the buses taking them to Brown Station could do the short runs, then go on to do other runs. Now they cannot do additional runs.

Placement Decisions And Information

Placement and Transportation

According to Access to Continuum Education Services, the MCPS handbook on procedures and guidelines, transportation is to be taken into account when placement decisions are made. The following are excerpts from that document:

- Transportation factors are always considered in placement decisions. (II-17)
- The appropriate program supervisor works cooperatively with the area supervisor of transportation...or the central transportation office... (II-17)
- Transportation superviors are consulted or invited to (CARD) meetings to assure that appropriate transportation can be arranged in a timely fashion. (III-11)

However, examples like those given in the previous section suggest that in many cases "transportation factors" may not be considered in placement decisions. Managers of the Transportation Division say that quite often "cooperation" amounts to their providing transportation whatever the problems and whatever the cost. And while transportation supervisors may be consulted or even invited to meetings, it is primarily "to assure that appropriate transportation can be arranged in a timely fashion" rather than to have any real voice in placement decisions.

This does not mean that transportation is entirely ignored. There is ample evidence that many of the professionals who have a voice in placement decisions do consider transportation as one of the many variables with which they must deal. However, while they are conscientious, they cannot possibly know the full impact on the transportation system of a particular decision. In any event, they are bound both by a professional ethic and by law to assign a child to the most suitable program, not to the one most convenient for the Transportation Division. This raises the question of the extent to which the Transportation Division can influence placement decisions and under what conditions.

Role of the New Transportation Assistant

It was pointed out that an assistant in special/alternative education transportation was added to the Transportation Division's central office staff in the FY 1983 budget. In the written justification for the position it was said that one of the important duties of the assistant will be to represent the division at CARD and other meetings. It was said that this will lead to more effective communication between the division and the Office of Special and Alternative Education and, in turn, result in a reduction of transportation problems and costs.

In some circumstances, the special education assistant might be able to influence a placement decision. If a child were diagnosed as learning disabled and there were two equally suitable SLD programs at different distances from the child's home, it could probably be agreed that it is more convenient to transport the child to one school rather than to another. This could, then, result in a reduction of transportation problems and perhaps to a reduction of costs.

In many other cases, the special assistant would have little impact on decisions. As had been said, the professionals who make placement decisions are bound by ethics and law to place a child in the most suitable educational program. Identification of the most suitable program is based on diagnosis of the child's handicapping condition, level of functioning, and needs. Unless the special education transportation assistant were a rather highly trained professional (psychologist, etc.)--an extremely doubtful proposition at best--it is not likely that the individual in the position would be able to argue the merits of placing a child in this or that program. In any case, handicapping condition and needs will determine placement, not convenience in transportation. For example, to take what might be considered a borderline case, a given child might be identified initially as either midly retarded or learning disabled. If subsequent diagnosis indicated that the child needed to be placed in an SLD program, that decision would not be changed simply because a school within walking distance of the child's home has a program for the midly retarded, but the nearest SLD program is five miles away.

There is yet another problem. There are certain times of the year when there are many AARD and CARD meetings. It would be utterly impossible for the special education transportation assistant to attend all of them. It would, of course, be possible to send written decisions to the assistant for review and recommendations. But this could be an unwieldy process that might turn out to be ineffective and could delay decision making, which, according to managers of the Transportation Division, is already a problem.

Finally, as has been discussed previously, the location of and changing the location of programs create transportation problems. The new assistant might be able to have an impact on decisions about the location of programs and thus save MCPS money. This could be true only if the assistant were invited to meetings in which the location of programs is discussed and if the Division of Transportation had the capacity to develop and work out the costs of alternatives.

Lack of Information

The director of the Department of School Services and the administrators of the Transportation Division report that placement decisions and decisions about the location of programs are not planned far enough in advance and that the Transportation Division is not informed of decisions in time to make adequate transportation arrangements. It is also said that plans are changed quickly and often. One of the area supervisors of transportation reported, for example, that a new program had been established at a given school, but no one in the division had been informed. He found out on the first day of school only when the area office began to get calls from irate parents who wanted to know why the bus had not picked up their children.

Lack of information probably increases transportation problems and costs. As has been said several times previously, every additional mile travelled by a bus increases the cost of fuel, the time the trip takes, and therefore the driver's hourly wage. Given adequate information and time, routes can be planned for maximum efficiency. Without information, adding buses, miles, or both to take care of problems becomes a costly substitute for planning.

Routing And Scheduling Problems

Routes and Time

Special education routes and schedules are more complex than others. Some special education pupils are literally transported from one end of the county to another. Many of the pupils are picked up at their homes instead of at central bus stops, which adds to the complexity of routes and schedules. Because some of the programs are designed for a small number of children, or because only a very few children in a given area may have to be transported by special education bus, sometimes only two or three children may constitute a bus run. To pick up one child may require a "detour" of four or five miles.

Coordination

Before the Transportation Division was decentralized, special education transportation was treated as a separate function and handled entirely from the central office (there was no other office). Now, while transportation for some of the supplementary centers is handled in the central office, most special education transportation is taken care of by the area offices. This creates problems of coordination. For example, a single child living in Area 3 may have to be transported to a program in Area 2. Meanwhile, five children living in Area 2 may have to be transported to a program in Area 1. Such routing and scheduling problems can become unbelievably complex.

Other Problems

Parents' Demands

The Transportation Division staff say that parents of special education pupils are more demanding than others and that responding to these demands absorbs an inordinate amount of time. This tends to be borne out by the data presented in Exhibit 7.1. Whereas only 8 percent of the parents of regular pupils said they were somewhat or very dissatisfied with the bus service, 16 percent of the parents of special education pupils expressed dissatisfaction. The differences in the percentages of parents who said they have asked for help or complained about the service are striking: 24 percent of the parents of regular pupils compared to 67 percent of the parents of special education pupils. While only 18 percent of the regular pupils' parents asked for help or made complaints four or more times, 34 percent of the parents of special education pupils did so. Even more striking is that only 5 percent of the regular pupils' parents, but 16 percent of the parents of special education pupils asked for help or made complaints six or more times.

It is true, of course, that many of the children in special education have problems which may be aggrevated by riding the bus, by the behavior of drivers or aides, and so on. Identifying reasons, however, does not alter the fact that by their own reports, parents of special education pupils do ask for help or complain about service more than parents of regular pupils. It is easy to understand that responding to their requests and complaints could absorb a great deal of staff time.

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EXHIBIT 7.1

A COMPARISON OF PERCENTAGES OF PARENTS OF REGULAR AND SPECIAL EDUCATION PUPILS RESPONDING TO SELECTED QUESTIONNAIRE ITEMS

Questions	Response	Percentage Regular	Percentage Special Education
In general, how satisfied are you with the typical home-school-home bus service?	Very Satisfied or Satisfied	92	84
	Somewhat Dissatisfied or Very Dissatisfied	8	16
In the entire time your child has been riding MCPS school buses, have you ever asked for help with a problem or made a complaint about the service?	Yes	24	67
	No	76	33
How many times (separate cases) have you asked for help or made a complaint?	1 time	39[a]	23[a]
	2-3 times	41	37
	4-5 times	13	18
	6-10 times	4	8
	More than 10 times	1	8

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[a] Percentages (both columns) of those responding to this question are only of parents who responded yes to previous question. Columns will not total to 100 percent because 3 percent of the parents of regular pupils and 6 percent of parents of special education pupils did not respond to the question.

Discipline

One of the managers of the Transportation Division said, "All rules and standards of discipline are put aside on special education buses." This was the description of a problem, not a statement of policy. It is a problem which virtually everyone in pupil transportation identifies, but about which apparently little has been done or can be done. On many runs, children with emotional and behavioral problems are grouped together on the same bus, and it would be nothing short of a miracle if behavior were not a problem.

The staff at some of the supplementary centers and other schools do try to impress pupils with the need for safe conduct (ie., good behavior) on buses. However, discipline is a complex matter which is related to training of drivers and aides, bus schedules, supervision at schools, and to other problems as will be shown below and in Chapter 8, 9, and 11.

Problems Reported by Principals

Principals also say that discipline on special education buses is a problem and that special education pupils who ride regular buses create more discipline problems than regular pupils.[4] In addition, special education bus schedules are not always synchronized with those of other buses. Therefore, principals say, the buses often arrive too early at the beginning of the school day or leave late at the end of the day. In either case, there is no one to supervise the special education pupils.

As was pointed out earlier, special education buses may cross administrative area boundaries. Therefore, principals say, it is often difficult to tell which area a particular special education bus is assigned to, and thus the principal may not know whom to contact when there is a problem.

Training of Drivers and Aides

The training of drivers and aides will be discussed in Chapters 9 and 11. As will be shown, the training given to drivers of special education buses and their aides is inadequate. Training is required, however, and is provided by the staffs of the various supplementary and program centers. But, there is no real coordination, so the subject matter covered and the quality of presentation vary considerably among centers.

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[4] Principals are responsible for handling bus discipline cases.

Effects On Pupils

Distance and Time

Exhibit 7.2 shows that according to parents, special education pupils spend far more time on the bus than do regular pupils. Only 3 percent of the regular pupils are said to spend more than an hour, while 48 percent of the special education pupils are said to spend that much time. The following are some of the reports by parents of special education pupils:

- My child leaves our home in Poolesville at 7:35, rides half an hour to Laytonsville, where the bus picks up other pupils, and arrives at school at 8:50.
- Our 5 year old leaves home at 7:10. School starts at 9:00. She gets home at 4:40. We do not like it but we did not complain because the driver and the aide are the best.
- My son's bus ride is 1½ hours; he gets bored and misbehaves on the bus.
- In the afternoon, it takes our child 2 hours and 10 minutes to get home after school ends. This includes waiting at school for an hour for the bus to arrive.
- Our 3 year old rides the bus for a total of 3 hours a day.

Such reports do, again, raise the question of whether or not transportation is actually taken into account when placement decisions are made or program locations are determined. It seems almost callused to subject children who are handicapped in some way to so many hours of boredom.

The staff of the Transportation Division may be capable of arranging better schedules and more efficient routes to avoid situations like those described here. They probably cannot do so under present circumstances, since they have no control whatsoever over where programs are located, where children live, and what children will be assigned to what program.

Class Time

Because of time, distance, and peculiarities of schedules, special education buses must sometimes arrive at school late and leave early. Many special education pupils are thus cheated out of a full day of school. Some 13 percent of the special education parents who responded to the questionnaire said their children miss a part of the instructional day, and this may be a conservative estimate because parents are not always able to tell when the bus arrives at or leaves school.

Transportation By Taxi

Under certain circumstances special education pupils may be transported to MCPS schools or to private schools by taxi. A child might live in an area not served by MCPS bus, and to send a bus to pick up the child might mean a detour of an hour from the regular route. The Transportation Division might, then, pay round trip taxi fare to get the child to and from an MCPS school. Some MCPS special education pupils are placed in private centers throughout the Washington metropolitan area. They are transported by taxi when the center is not served by a school bus. At any given time, about 25 pupils who attend MCPS schools and 100-150 who attend private schools are transported by taxi. The cost is between $40,000-$45,000 per month, or $400,000-$450,000 per school year.[5]

Problems

It is reported that there are many problems involved in taxi transportation. The cabs are often late and are generally not as dependable as the school buses. It is also said that some taxi drivers do not want to deal with pupils. Fighting is reported to be common when as many as three or four children are in the cab at the same time. Even single pupils can create problems for a driver. Some have attempted to "escape" from the vehicle. One child, it was reported, kicked the windshield out of a cab.

Discussion

MCPS is operating what are, in effect, two large and competing bus services. The 3,000 special education pupils and the nearly 200 special education buses constitute a service larger than that operated by many school districts throughout the country. The 47,000 regular pupils and the approximately 400 regular buses constitute a major service equalled only by the largest school districts in the nation. These two services are competing in the sense that financial resources, particularly staff and staff time, are limited and that 6 percent of the pupils who are transported by school bus account for 32 percent of the buses, 35 percent of the miles, 32 percent of driver's salaries, and an enormous proportion of staff time. As was said about services and the budget,

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[5] Between $600,000-$700,000 is budgeted for private transportation, including airplane transportation for pupils who are placed in centers outside the state.

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EXHIBIT 7.2

A COMPARISON OF ROUND TRIP TIME SPENT ON BUS REPORTED BY PARENTS OF REGULAR AND SPECIAL EDUCATION PUPILS

	Percentage of Parents	
Reported Round Trip Time	Regular	Special Education
30 minutes or less	72	18
30 minutes to 1 hour	25	34
Between 1 hour and 2 hours	2	39
2 hours or longer	0	8
No response	1	1
TOTAL	100	100

the Transportation Division can do little on its own to solve most of the problems discussed in this chapter, of which the following are the major ones:

- Disproportionate resource distribution between regular and special education and the need for adequate funding and staffing for both
- Divided responsibility for special education routing and scheduling within the Transportation Division, with part of the task being assigned to the division's central office and the larger part being assigned to area transportation offices in which the staff is severly limited
- Lack of communication between the Office for Special and Alternative Education and the Division of Transportation
- Amount of time devoted to dealing with the requests and complaints made by parents of special education pupils and the need for a fair, cost-effective, and systematic way to resolve problems
- Discipline on special education buses and among special education pupils who ride regular buses, and the need for coordinating the handling of disciplinary cases (see also later chapters)
- Lack of adequate training of special education bus drivers and aides
- Effects of time and distance travelled by special education pupils

These problems are interrelated and can be solved only if policies, procedures, and the means of implementing them are developed at the highest administrative levels of MCPS. Yet recently, only one action has been taken to help the Transportation Division serve all of the pupils for which it is responsible[6]: the creation of the position of special and alternative education assistant. Certainly the position is badly needed simply because the division needs more staff to deal with special education. However, for reasons discussed earlier, it is extremely unlikely that the creation of this position and the best efforts of the person who fills it will solve all of the problems caused by lack of communication and coordination between Special and Alternative Education and the Division of Transportation.

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[6] Reconstituting the position of radio driver to route supervisor will contribute little or nothing to solving special education transportation problems. See later chapter dealing with the deployment of staff.

Recommendations

In Chapter 6 it was recommended that a team (committee, etc.) should be formed or a procedure established to review current transportation policies and to recommend additional policies for the operation of pupil transportation. Either that team or an equally high-level task force should develop policies and the means for implementing policies for special education transportation which take the following into account:

- Establishment of separate line items (within the Transportation Division budget) for regular transportation and special education transportation providing true and adequate financial resources and records for both services
- Centralization within the Transportation Division, with adequate staffing, of all special education transportation routing, scheduling, and control of special education buses and of private transportation
- Establishment of a permanent Special Education and Division of Transportation liaison team and the development of systematic procedures for determining placement of programs and communication of location of programs and program assignments of pupils
- Procedures for handling requests and complaints of parents and policies which establish reasonable limits on compliance with requests
- Coordination of disciplinary procedures
- Division of Transportation responsibility for the coordination and standardization of training given to drivers and aides in special education transportation and standardization of training among special and alternative centers
- Establishment of limits of time, distance, or both to be travelled by special education pupils and method of transportation and funding if limits are adhered to

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CHAPTER 8

THE DELIVERY OF SERVICES

Introduction

This chapter deals entirely with home-school-home bus service: how parents (or pupils) find out about the service, the bus schedules, the quality of service, discipline, and bus accidents. Since Chapter 4 provides an overall evaluation of the service, it is assumed that most of what is said there does not need to be repeated. It is worth repeating, however, that 89 percent of the parents said they are satisfied or very satisfied with the bus service and that 84 percent of the principals said it is good to excellent. This evaluation should not be forgotten when problems of operation are identified here.

Before Schools Open In September

Responsibilities

It is the responsibility of the Transportation Division to plan bus routes and schedules and to inform principals about such things as which buses will serve the school, the location of bus stops (if new ones have been added or old ones consolidated), and bus schedules.[1] The planning is done at each of the three area transportation offices.

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[1] This chapter deals only with short-range planning. Chapters 13 and 14 deal with route planning and scheduling.

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Principals are responsible (MCPS Regulation 215-1) for maintaining an accurate record of pupils transported by bus. The record is to include the following for each pupil:

- Name, home address, telephone number
- Grade or homeroom teacher
- Bus on which pupil is authorized to ride, identified by destination, route, and/or area served
- Date the information is recorded

While the principal is made responsible for maintaining the record, the regulation does not make the principal responsible for authorizing a pupil to ride a bus or assigning pupils to buses. It also does not make the principal responsible for providing the Transportation Division with a copy of the record, or, indeed, with any information at all.

In fact, present MCPS policies and regulations do not clearly fix responsibility or establish procedures for determining whether or not a particular pupil is eligible for transportation; how the pupil or parents are to be informed of the child's eligibility; or how pupils and parents are to be informed before the opening of school about buses, routes, schedules, and bus stops. As a consequence, an informal system has developed in which the Transportation Division does some jobs and principals do others. Some jobs are not done at all because responsibility for doing them is not established.

Information from Transportation Division

Area transportation staff report that they provide principals with information about buses and routes within the first two weeks in August, giving them time to inform parents before the opening of school in September. They say, however, that some principals (to save postage, to get the job over with, etc.) send information to parents in June when they send out other materials at the end of the school year. In such cases, the information provided to parents could be incorrect if a bus number, route, schedule, or bus stop were changed by the Transportation Division staff during the summer.

Information Provided by Principals

Exhibit 8.1 shows percentages of respondents who answered questions about when and what information was given to parents. Only a small percentage of principals said they sent out bus information before July. However,

Exhibit 8.1

INFORMATION GIVEN TO PARENTS AND WHEN PROVIDED: 1981-82

Principals

Information	Percentage Responding Before July	July-August	Don't Give
Location of bus stop	5	86	9
Bus number	4	87	9
Time to get bus going to school	2	87	11
Time bus arrives at home/ stop after school	2	70	28

Parents

	Percentage Responding[a] June or Earlier	July-August	September	Not Informed
Question: When were you told about the location of the bus stop and times for pickup and drop-off for this school year?				
Parents of pupils in regular program	18	52	11	12
Parents of pupils in special education	5	73	8	10

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[a] Small percentages (7 percent and 6 percent) of parents did not respond to this item, and therefore totals will not equal 100 percent.

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18 percent of the parents of children in the regular program said they were given information in June or earlier.[2] If this is true, than about 8,500 of the 47,000 regular pupils who are transported received premature, and therefore potentially inaccurate information about buses, routes, and schedules.

Quite unexpectedly, a substantial percentage of principals said they did not provide parents with what would seem to be essential bus information. Between 10 percent and 12 percent of the parents confirmed this. If 11 percent can be taken as a reasonble average, then about 5,500 of the 50,000 pupils (including special education pupils) received no information about buses, routes, schedules, and stops from either the schools or the Transportation Division.

If the above figures are combined, it would appear that about 28 percent of all pupils who are transported (or their parents) received premature and potentially inaccurate information or no information at all about buses, routes, schedules, and stops at the beginning of the 1981-82 school year. However, only 6 percent of the parents of regular pupils (not shown in Exhibit 8.1) reported that the information they had at the beginning of the school year was inaccurate. It is therefore likely that many parents find out how their children will get to school from other parents, not from the schools. It is also likely that many principals simply reproduce and mail out the information they get from the Transportation Division, letting parents figure out the whole thing for themselves.

Principals and parents were asked how information was transmitted. About 80 percent of the principals said they sent it to parents by letter (34 percent) or by parent newsletter (46 percent). But only 66 percent of the parents of regular pupils said they received a written notice from a principal. Of course, percentages may not necessarily correspond. However, the 15 percent disparity is curious if not suspicious. It suggests that it is possible that a larger percentage of principals than reported here sent out no information. It is also possible (and highly probable) that a large percentage of them are not keeping up-to-date records of pupil's addresses and that parents did not receive information even though it was mailed.[3]

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[2] About 65 percent of the parents of special education pupils said they depend on the Transportation Division, not the schools, to send them information.

[3] The MORE project team found, when sending out questionnaires, that many addresses are not current, i.e., are not updated in the Pupil Data Base. Many questionnaires were returned by the post office and some probably disappeared into a void.

Information to Transportation Division

The Transportation Division does not obtain much information useful for planning from the schools or from other MCPS offices. Each area transportation office gets load counts (number of pupils per bus per run) from drivers and attempts to keep them current. These load counts provide an estimate, but only an estimate, of the number of pupils who will need to be transported to the schools in the area and, therefore, an estimate of the number of buses that will have to be assigned to each school.

Whenever there is time, which there almost never is, area transportation supervisors attempt also to obtain, on their own, information about new housing developments in the area and about other changes which may affect numbers of pupils, buses, and bus routes. There are no policies, regulations, or procedures which make other MCPS offices responsible for providing the Transportation Division with information, even though other offices may collect data that would be quite valuable for planning.[4]

Opening Of Schools

Number of Buses Assigned

As might be expected from what has been said above, the Transportation Division is almost forced into error. While their estimates are surprisingly good, either too many or too few buses are often assigned to schools at the beginning of the school year.

Exhibits 8.2 and 8.3 show the percentages of principals and drivers responding to questions about the number of buses assigned at the beginning of school in 1981-82. Principals were asked only about increases in enrollment and the number of buses assigned to take care of increases primarily because too many pupils and too few buses could result in a chaotic situation during the first week or two after schools open.[5] Only a small percentage of principals reported increases in enrollment for any reason, including the closing of other schools (Exhibit 8.2). The majority of those whose schools experienced

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[4] Again, planning is dealt with in greater detail in Chapter 11.

[5] Either the same number of pupils and buses as the previous year or too few pupils for the number of buses assigned would create few or no problems. In addition, asking about increases provided information about the impact of closing schools.

Exhibit 8.2

PRINCIPALS' ASSESSMENT OF BUSES ASSIGNED AND BUS LOAD 1981-82

All Principals

Question	Percentage Yes	Percentage No
Did your school experience an increase in the number of pupils eligible for transportation because of the closing of another school or schools?	8	92
Did your school experience an increase in the number of pupils eligible for transportation for any reasons other than the closing of another school(s)?	15	85

Principals Whose Schools Experienced Increased Enrollment

Question	Percentage Yes	Percentage No
Were enough buses assigned to transport the additional pupils eligible for transportation because of the closing of another school(s)?	75	17[a]
Were enough buses assigned to transport the additional pupils eligible for transportation for other reasons?	74	26

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[a] No response = 8 percent.

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Exhibit 8.3

DRIVERS' ASSESSMENT OF BUSES ASSIGNED AND BUS LOADS 1981-82

Number of Buses Assigned

	Percentage	
	Beginning of School Year	MidYear[a]
Which of the following describes the situation at the schools you take pupils to and make pickups from?		
More buses assigned than needed	1	2
About the right number of buses assigned	74	76
Too few buses assigned	12	11
Unable to judge	13	20

Bus Loads

	Beginning of School Year	MidYear[a]
Which one of the following describes the usual condition of your bus?		
Overcrowded, some pupils standing in aisles	13	8
All or almost all seats occupied but no one standing	53	76
About ¼ of seats not occupied	17	8
About ½ or more seats not occupied	11	5

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[a] Midyear was taken as late January and early February of 1982. All columns do not total to 100 percent because of small pe centage of no responses.

an increase in enrollment said that enough buses were assigned at the opening of school to take care of the increase. However, 17 percent said there were not enough buses to accommodate the increase caused by school closings and 26 percent said there were not enough to take care of the increase caused by reasons other than closing of schools. Drivers (Exhibit 8.3) agreed very closely with principals, with 74 percent saying that the right number of buses were assigned and 12 percent reporting that too few buses were assigned at the beginning of the school year.

Bus Loads

Driver reports on bus loads at the beginning of the year reflect what must be a confused and confusing situation. Only slightly more than half (53 percent) of the drivers said that their buses were what might be considered optimally loaded: almost all seats occupied and no pupils standing. But 13 percent reported overcrowding and 28 percent reported underutilization of bus passenger capacity. Responses show a clear difference between the beginning of the year and midyear. Seventy-six percent of the drivers said that at mid-year almost all seats were occupied and there was no overcrowding. This suggests, of course, that the Transportation Division staff made appropriate adjustments in buses and routes after they obtained information. Some reports of overcrowding (18 percent) or underutilization (13 percent) of buses at mid-year are probably to be expected. Underutilization is common on special education buses, which may be able to carry few pupils on a given run.

The Service

The overall evaluation of the transportation service by parents and principals has already been reported in Chapter 4. It is therefore possible to deal here in more detail with certain aspects of service and some of the problems encountered by parents and principals.

Physical Condition of Bus and Equipment

Exhibit 8.4 shows the percentages of parents responding to certain selected questionnaire items, including questions dealing with the physical condition of buses. In general, it looks as if the buses are kept clean. They are also in good mechanical condition as evaluated by the drivers and reported in Chapter 4 (Exhibit 4.1).

Though the vast majority of parents of special education pupils are satisfied with the special equipment provided on the buses (wheelchair lifts, harnesses, etc.), 11 percent said they are dissatisfied. Managers of the Transportation Division are also not entirely satisfied with the equipment, some of which is said to be outmoded, e.g., wheelchair brackets that have to be bolted and

Exhibit 8.4

PERCENTAGES OF PARENTS RESPONDING TO SELECTED QUESTIONS ABOUT BUSES, DRIVERS, AND BUS AIDES
1981-82

Questions/Ratings	Respondents	Response	Percentage Respondents[a]
CONDITION OF BUS			
Is bus clean on outside?	Parents regular pupils	Yes	82
Is bus clean inside?		Yes	66
		No	13
		Cannot judge	20
How satisfied are you with the special equipment...provided or help given to child?	Special education parents	Very satisfied or satisfied	89
		Dissatisfied	11
DRIVER AND AIDE			
Is the driver courteous?	Parents regular pupils	Yes	82
		No	9
		Cannot judge	8
Does driver drive carefully?		Yes	79
		No	7
		Cannot judge	14
Does driver take safety precautions when bus is stopped?		Yes	88
		No	2
		Cannot judge	10
Is driver sensitive to child's physical or emotional needs?	Special education parents	Always	54
		Usually	8
		No	2
		Cannot judge	34
Does aide take care of child's physical or emotional needs		Yes	57[b]
		No	6
		Cannot judge	37

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[a] Within categories, percentages will not equal 100 percent because of cases of no response.

[b] Percentages of parents of children whose bus is assigned an aide.

unbolted with wrenches. They also said, however, that some of the equipment provided by parents is not sturdy enough for use in a large moving vehicle. Very light aluminum wheelchairs, for example, are not designed so much for safety as for ease of movement.

Drivers and Aides

According to the many comments written by parents, most of the drivers and aides are paragons. They are courteous, drive carefully, and take proper safety precautions when the bus is stopped (Exhibit 8.4).[6]

Again, the opinions of the parents of special education pupils differed from those of other parents. Only 62 percent said that drivers are sensitive to the needs of special education pupils, and only 57 percent said the aides care for their child's physical or emotional needs. It would be unfair to say that parents of special education pupils do not appreciate the drivers and aides. They too wrote many favorable comments and, it must be remembered, evaluated the overall service quite highly.

Bus Schedules

Exhibit 8.5 shows the percentage of parents and principals responding to selected questions about bus schedules. The parents of pupils in the regular program report that the school bus arrives on time both on the way to school (93 percent) and on the return home (95 percent). However, 10 percent of the parents said they had to take their children to school five or more times because the bus was late or failed to arrive.[7] In addition, 7 percent of the parents reported that their children missed school more than twice because the bus was late or failed to arrive.

The driver's leaving at the end of the school day before all pupils have boarded the bus is primarily a problem for special education pupils and their parents. Some physically handicapped pupils, for example, cannot get from the classroom to the bus loading area as rapidly as other students. Whatever the reason, 20 percent of the parents of special education pupils said the bus left school too soon at least once in 1981-82, 10 percent said this occurred more than twice, and 4 percent said it happened more than four times. It was

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[6] Accidents will be discussed later in the chapter. Parent's evaluations here seem to differ from the actual data and from the opinions expressed in the local press recently. However, parents may be right after all. Only a very small percentage of the children who ride the buses are injured in accidents.

[7] The question was limited to 5 or more times to avoid including the infrequent or even the rare case as a yes response. If a bus is very late and a parent takes a child to school, the bus has failed to appear for that parent.

Exhibit 8.5

PERCENTAGES OF PARENTS AND PRINCIPALS RESPONDING TO SELECTED QUESTIONS ABOUT BUS SCHEDULES: 1981-82

Questions	Respondents	Response	Percentage Respondents[a]
Does your child's bus usually arrive on time or within 10 minutes of schedule?	Parents regular pupils	Yes, on way to school	93
		Yes, returning from school	95
Have you had to take child to school 5 or more times because bus was late or failed to arrive?		No	89
		Yes	10
Has child missed school more than 2 times because bus was late or failed to arrive?		No	92
		Yes	7
Has bus left school before child has boarded it?	Special education parents	Never	74
		1 time	10
		2-3 times	6
		4-5 times	3
		More than 5 times	1
How frequently are buses late at beginning of day?	Principals	Daily	8
		Frequently	16
How frequently are buses late at end of day?		Daily	12
		Frequently	17
How many complaints do you get from teachers because bus(es) are too early at beginning of day?		Large number	1
		Small to none	94
How many because buses are late after school?		Large number	13
		Small to none	77

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[a] All possible responses are not given by category, so total will not be 100 percent.

reported that sometimes another bus had to be sent to the school to pick up a child. In other cases, some member of the school staff had to take a child home or a friend or neighbor had to be sent to the school to get the child.

Some 24 percent of the principals said that lateness of some of the buses serving their schools on before-school runs is a frequent to daily occurrence, and 29 percent said that late buses after school is also a frequent to daily event.[8] Apparently the late bus at the beginning of the school day does not create too many problems for teachers, though a late bus at the end of the day does. Almost all of the principals (94 percent) said they receive only a small number of or no complaints from teachers about the bus that is late in the morning, but 13 percent said they receive a large number of complaints about the one that is late after school. The reason is easy to understand. At the beginning of the day, a late bus might result in a brief interruption of class. At the end of the day, the teachers may have to stay and supervise the pupils who are waiting for the bus.

Road Emergencies

Considering the general excellence of the preventive maintenance program, it is somewhat surprising that 47 percent of the drivers (Exhibit 8.6) reported that their buses had broken down during a run between September 1981 and late January 1982. However, 58 percent of the principals reported that emergencies which cause pupils to arrive or leave late occur only occasionally, and 40 percent said they are rare.[9] The Transportation Division is apparently handling road emergencies in such a way as to minimize disruption of pupil's and school's schedules.

How road emergencies are handled properly belongs in Part III. However, there is one problem which involves the safety of pupils and the laws under which buses are to be operated: Few of the buses are equipped with a radio, though the area transportation offices and depots are. Therefore, when a bus breaks down on the road, the driver has no way to contact the Transportation Division from the bus. The driver cannot leave the bus while children are aboard. Children are not to leave the bus after they have boarded it. The question to drivers, then, was how they get in touch with the Transportation Division (Exhibit 8.6). It must be emphasized that the question was not restricted to the situation in which children are aboard the bus, and therefore

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[8] This does not contradict the 93-95 percent of the parents who say buses are on time. Small deviations from schedule are cumulative and are therefore greatest at the school, the end of the run. In any case, it would require only that one bus out of several be late every day for principals to see lateness as a daily occurrence.

[9] The reverse of the late bus situation. Three road emergencies a day could account for half of the fleet in 100 days, but on any given day few schools would be affected.

Exhibit 8.6

PERCENTAGES OF DRIVERS AND PRINCIPALS RESPONDING TO SELECTED QUESTIONS ABOUT ROAD EMERGENCIES: 1981-82

Questions	Respondents	Response	Percentage Respondents[a]
Since the beginning of the school year, has your bus broken down on the road while you were doing a run?	Drivers	Yes	47
		No	53
How frequent are bus road emergencies which cause pupils to arrive or leave late?	Principals	Occasional	58
		Rare or never	40
When a road emergency occurs which will cause a bus to be late before or after school, does the driver or the Transportation Division usually inform you so you can tell teachers and/or adjust to the emergency?		Yes	32
		No	68
Which are you most likely to have to depend on to call the Transportation Division for help if your bus breaks down on the road?	Drivers	Bus radio equipped can make call	3
		Make call myself but not from bus	59
		Send pupil to call	6
		Get help from other MCPS driver	5

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[a] All possible responses not given, so totals will not be 100 percent. There were also small percentages of no response.

it cannot be assumed that 59 percent of the drivers simply flout the dictates of common sense by leaving the bus. However, it is disturbing that 6 percent said they send a pupil to get help and that a certain percentage of the drivers (but not 59 percent) leave the bus when children are aboard. This is a situation which badly needs to be corrected.

Complaints And How They Are Handled

Area transportation staff report that they are never told they are doing a good job and that they seem to spend an enormous amount of time responding to and dealing with complaints about the bus service. The director of the division also reports that a large part of his time is spent dealing with parents' problems and demands. The impression throughout the division is that a parent will call everyone from the principal of the child's school (who also calls the Transportation Division) to the superintendent of schools to get some kind of special service or resolve a complaint.

Number of Complaints or Requests

Exhibit 8.7 shows percentages of parents of regular pupils and principals responding in given ways to questions dealing with requests or complaints. Principals reported that they do not receive many complaints: 43 percent said they receive fewer than one complaint a month or none at all, and 32 percent said they receive only one to three complaints in a month.[10] Of all the problems listed on the questionnaire for principals to evaluate, only one was said to cause a large to moderate number of complaints from parents: late buses, especially buses which are late on the way to school.

Only 24 percent of the parents said they had asked for help or made a complaint at all in the entire time their child has been riding MCPS buses. Of this 24 percent, 80 percent (or 19 percent of all parents responding) said they had asked for help three or fewer times. Slightly more than 61 percent of the pupils whose parents responded to the questionnaire have been riding MCPS buses for three years or longer, and 34 percent have been doing so for five years or longer. Thus, the "complaint rate" is about one per year or less, and that from about 20 percent of the parents. According to principals, that complaint is most likely to be about a late bus.

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[10] Again it must be remembered that for principals complaints are cumulative and that 1-3 complaints a month from the parents of all pupils in a school who ride buses represent a very small number.

Exhibit 8.7

PERCENTAGES OF PARENTS AND PRINCIPALS[a] RESPONDING TO QUESTIONS ABOUT FREQUENCY OF COMPLAINTS ABOUT BUS SERVICE 1981

Questions	Response	Percentage Of[b] Respondents
PARENTS OF REGULAR PUPILS		
In the entire time your child has been riding MCPS school buses, have you ever asked for help with a transportation problem or made a complaint about the service?	Yes	24
	No	76
If you answered yes to the previous question, how many separate cases?	1	39
	2-3	41
	4-5	13
	6+	5
PRINCIPALS		
During the course of a school year, how many complaints do you get from parents about the bus service?	None	3
	Fewer than 1 a month	40
	1-3 per month	32
	4-5 per month	9
What number of complaints are about:		
Bus late or no-show on way to school?	Large	24
	Moderate	28
Bus late or no-show after school?	Large	15
	Moderate	17

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[a] Parents of pupils in regular program. Special education problems are discussed in detail in Chapter 7.

[b] Within categories, percentages will not equal 100 percent because all response choices are not included and there was a percentage of no response.

To Whom Complaint or Request Is Made

As can be seen in Exhibit 8.8, when parents ask for help or make a complaint about the bus service, most first call the principal of their child's school (49 percent) or the area transportation office (23 percent). Unfortunately, 13 percent reported that they first contacted the central office of the Transportation Division. This means, though parents do not know it, that someone at the central office must not only handle the original call, but must also call the area transportation office. Thus, while 13 percent of the 24 percent who said they asked for some kind of help represent only 3 percent of all parents, they could, in the course of a year, be responsible for more than a thousand telephone calls to the division's central office and another thousand from the central office to the area offices. Under the current organization, the central office is not prepared to deal with this many calls.

The vast majority of principals (87 percent) first contact the area transportation office when they need help with their own or a parent's transportation problem (Exhibit 8.8). A small percentage (7 percent) say they first contact the bus driver, and an even smaller percentage (3 percent) say they first contact the central office of the division. It is apparent that area transportation supervisors adequately handle most problems: 90 percent of the principals reported that they were not referred elsewhere and that problems are solved in a reasonable period of time (91 percent) to their satisfaction (84 percent).

Parents reported that they were treated courteously (92 percent) by individuals who understood the problem (85 percent) and who showed concern for their and their child's rights (81 percent). As can be seen in Exhibit 8.8, parents were not as satisfied as principals with the time it takes to get a response or the way in which problems are resolved. However, it must be remembered that the percentages are of the 24 percent of parents who said they had asked for help at all. Therefore, the 34 percent who said the problem was not resolved to their satisfaction represent only a very small percentage of all parents.

Lack of Coordination

There is no doubt that requests for service and complaints made by parents can represent a very large number of telephone calls even though the actual complaint rate is very low. It is therefore small wonder that the area transportation staff and the division director often feel overwhelmed. The problem, however, is not so much the sheer number of calls as it is the lack of a coordinated system for handling requests and complaints. As matters now stand, problems are dealt with by principals of 178 schools, by three area transportation offices, and sometimes by a number of other MCPS offices as well. Often, to resolve a complaint, staff members have to consult regulations; go out in the field to measure distances when eligibility for transportation is disputed; or talk with drivers, who report to depots, not to

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Exhibit 8.8

PERCENTAGES OF PARENTS AND PRINCIPALS[a] RESPONDING TO QUESTIONS ABOUT HANDLING COMPLAINTS ABOUT SERVICE
1981

Questions	Response	Percentage Of[b] Respondents
PARENTS OF REGULAR PUPILS		
When you asked for help or made a complaint, what person or office did you contact first?	Principal	49
	Area TD office	23
	TD central office	13
Were the people with whom you dealt courteous?	Yes	92
	No	5
Did they understand your problem?	Yes	85
	No	11
Did they show concern for your and your child's rights?	Yes	81
	No	5
Did they respond in reasonable time?	Yes	75
	No	20
Was the problem resolved?	Yes	74
	No	22
Was it solved to your satisfaction?	Yes	62
	No	34
Who or what office made the decision?	Principal	24
	Area TD office	73
PRINCIPALS		
When you need help with a transportation problem, whom or what office do you contact first?	Area TD office	87
	Bus driver	7
	TD central office	3
Does the individual or office usually solve the problem:		
Without referring you elsewhere?	Yes	90
Within a reasonable period of time?	Yes	91
To your satisfaction?	Yes	84

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[a] Only the 24 percent of parents who said they had asked for help or made a complaint.

[b] Percentages will not equal 100 percent within categories because all possible responses are not given and there was a percentage of no response.

[c] TD = Transportation Division

area offices where the transportation staff are housed. All of this takes up the time of the very few staff members who should, instead, be able to devote their efforts to managing the transportation system so that problems do not arise in the first place.

Discipline

Discipline is not a major problem on regular buses, but it is a problem on special education buses (see Chapter 7). The parents of regular pupils (69 percent) reported that good discipline is maintained.[11] Principals and drivers reported a low incidence of disciplinary cases on regular buses. The problems, then, are how parents and pupils are informed of the rules of safety and discipline and how discipline cases are handled.

Information Given to Parents or Pupils

According to MCPS Regulation 215-1, principals are responsible for "providing classroom instruction on safety rules for school bus riders." (It should be noted that safety and conduct rules are very much the same.) Responses by parents and principals to questions about the information provided about conduct rules (Exhibit 8.9) suggest that a certain number of principals are not adhering to the regulation. Twenty-seven percent of the parents said they or their children were not told in advance about rules of conduct and penalties, which can include suspension of riding privileges. Only 84 percent of the principals said that their teachers orally inform pupils of the rules and penalties, and only 68 percent claimed that principals send information home to parents.

Driver's Report

When a pupil violates a safety or conduct rule, it is up to the driver to determine whether or not a disciplinary report will be made. Some principals reported that drivers do not turn in disciplinary reports until a case becomes a major one. Drivers said they often do not know the name of an offender and that secondary pupils will sometimes refuse to give their names to drivers who want to file reports (reflecting the fact that drivers do not know who rides the buses).

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[11] With 15 percent saying they could not judge, a response which, in this case, must be considered favorable.

Exhibit 8.9

PERCENTAGES OF PARENTS AND PRINCIPALS[a] RESPONDING TO QUESTIONS ABOUT DISCIPLINE INFORMATION
1981

Questions	Response	Percentage Of[b] Respondents
PARENTS OF REGULAR PUPILS		
Were you or was your child told in advance of the rules of conduct on the school bus and the penalties for violating them?	Yes No	64 27
PRINCIPALS		
Do you inform parents and pupils about the rules of conduct on school buses and the penalties for violating them by the following methods:		
Teachers orally inform pupils?	Yes No	84 16
Pupils given written information to take home?	Yes No	68 26
Information is mailed to parents?	Yes No	54 40
Parents informed orally at PTA or other meeting?	Yes No	50 46
When a driver fills out a disciplinary report on a pupil is a copy of the form or other record or information:		
Sent to the pupil's parents?	Yes	54[c]
Kept on file at the school?	Yes	91
Sent to the area transportation office?	Yes	65

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[a] Parents of pupils in regular education program.
[b] Totals will not equal 100 percent because not all responses are reported.
[c] In this group, there were few cases of no response; it can be assumed that the alternate response was no.

When a disciplinary report is filed, the driver uses MCPS Form 555-3, which is turned in to the principal, not to the area transportation supervisors. Division of Transportation staff say that the form "begs to be lost" because it is too small and poorly designed.

Information When a Case Occurs

Principals are responsible for handling discipline cases. Regardless of who handles a case, it would seem logical that a pupil's parents should be informed that a report has been submitted for their child, particularly in view of the potential severity of the penalty: loss of bus riding privileges. It would also seem logical that the school should keep a file of discipline reports for each pupil for future reference, if only to identify repeat offenders. However, MCPS regulations do not require principals to inform parents or to keep a cumulative record.

Despite the lack of regulations, 54 percent of the principals say they inform a pupil's parent when the child has been reported as a discipline case (Exhibit 8.9), and 91 percent say they keep some kind of file of reports. In addition, 65 percent say they send a record of a report to the area transportation office. If the principals meant sending information about the disposition of a case, then a large percentage of principals do not follow MCPS Regulation 215-1, which states that "the principal is responsible for (c) completing....Form 555-3 indicating the action taken and forwarding copies to the field supervisor for transportation..."

Handling of Cases

Exhibit 8.10 shows principals' and parents' responses about the handling of disciplinary cases. In most schools, the severity of a case determines who will deal with it. Assistant principals and other staff members deal with the minor problems (61 percent), principals and assistant principals deal with major ones (95 percent), and principals (83 percent) generally make the decision about the suspension of bus riding privileges.

Only 8 percent of the parents reported that their child had ever received a formal warning about behavior on the bus, which, because principals may not inform them (Exhibit 8.9), does not mean that only 8 percent of all bus riders are reported by drivers. Only 3 percent of the parents said their child had been penalized for behavior on the bus. Of that very small 3 percent, 58 percent said the warning or penalty was justified. Apparently, however, even those who did not believe it justified said that the situation was handled fairly (76 percent).

Exhibit 8.10

PERCENTAGES OF PRINCIPALS AND PARENTS[a] RESPONDING TO QUESTIONS ABOUT HANDLING OF DISCIPLINE 1981

Questions	Response	Percentage Of[b] Respondents
PRINCIPALS		
At your school who is immediately responsible for the following in school bus discipline cases?		
Dealing with minor behavior problems?	Principal	33
	Ass't. Principal	24
	Other staff	37
Dealing with major behavior problems	Principal	74
	Ass't Principal	21
Deciding to suspend pupil's bus riding privileges?	Principal	83
	Ass't Principal	14
PARENTS OF REGULAR PUPILS		
In the entire time your child has been riding MCPS school buses has she/he ever received a formal warning about his/her behavior on the bus?	Yes	8
	No	91
Has she/he ever been penalized for behavior on the bus?	Yes	3
	No	96
PARENTS ANSWERING YES TO ABOVE QUESTIONS		
Was the warning or penalty justified?	Yes	58
	No	42
Was the situation handled faily with attention to your and your child's rights and the rights of others?	Yes	76
	No	22

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[a] Parents of pupils in regular education program.

[b] Totals will not equal 100 percent because not all responses are reported or because of a percentage of no response.

Drivers' Views

Drivers tended to agree with parents and principals that discipline is not a major problem. The following percentages of drivers responded to the question, "How much of a pupil disciplinary problem is each of the following for you":

	How Much of a Problem			
	Major	Important	Small	None
Violations of bus safety rules	6	13	33	44
Fighting or physical abuse of others	3	7	18	69
Verbal abuse of driver	4	5	16	72
Smoking	4	4	9	82
Noise	6	16	39	38
Physical horseplay	3	17	39	38

As can be seen, only violations of safety rules, noise, and physical horseplay were identified as important problems by any substantial number of drivers.

In addition, 60 percent of the drivers said the action taken by the schools in disciplinary cases usually solves the problem for at least a reasonable period of time (20 percent said they had no experience with discipline cases and could not answer). According to 53 percent, problems are typically resolved within one to two school days, and 61 percent said they are resolved within one school week.

Accidents

MCPS has a high rate of school bus accidents. The problem is closely related to training and supervision of drivers and is therefore dealt with in Chapters 9 and 12. Here, it seems appropriate to accept accidents as a normal hazard of service and look at the problem from the point of view of parents.

It has already been pointed out (Exhibit 8.4) that the parents of regular pupils believe that the driver of their child's bus drives carefully (79 percent with only 7 percent negative response) and takes proper safety precautions when the bus is stopped (88 percent positive, 2 percent disagreement). Exhibit 8.11 shows that parents have good reason to believe that the buses are safe. Only 10 percent reported that their child was riding a bus that was involved in any kind of accident in the entire time the child has been riding MCPS buses. (This does not mean, by the way, that 10 percent of all of the buses were involved in accidents.) Even more important is the fact that only 0.8 percent of the parents said that their child had been

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Exhibit 8.11

PERCENTAGES OF PARENTS OF REGULAR PUPILS RESPONDING TO QUESTIONS ABOUT ACCIDENTS: 1981-82

Question	Percentage Responding		
	Yes	No	DNA/NR[a]
In the entire time your child has been riding MCPS school buses, has a bus on which your child was riding been involved in an accident?	10.2	86.6	3.2
Has your child ever been injured in an accident involving the bus and another vehicle or in which the bus ran into something or ran off the road?	0.8	94.1	5.1
Has your child ever been injured on board a school bus because of horseplay, faulty equipment, etc. but not vehicular accident?	3.3	94.4	2.3
Whatever the cause, were you notified of the accident promptly? (Most recent case.)	2.5[b]	6.5[b]	91.0
Have you ever filed a claim against MCPS for injury or property damage caused on or by an MCPS school bus?	1.0	86.1	12.9
Was the claim settled satisfactorily and fairly with regard for your rights and the rights of others, including MCPS? (Most recent case.)	0.8[c]	1.7[c]	97.5

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[a] DNA = does not apply to me/my child. NR = no response. They are combined here.

[b] To answer yes or no, parent would have had to answer yes to either of the two previous questions.

[c] To answer yes or no, parent would have had to answer yes to previous question.

injured in a vehicular accident. A far larger percentage (3.3 percent) said that injury was caused by horseplay or faulty equipment.[12] Furthermore, only 1 percent of the parents said they had filed a claim against MCPS for injury or property damage caused on or by a school bus--a statement which can include damage to a parent's fence and not necessarily injury to a child. In a county in which citizens have a reputation for being litigious, this is probably an excellent measure of the extent of injury caused by bus accidents.

There is one problem which can be identified regardless of the safety record of the buses. The Transportation Division does not know the names, addresses, parents, parent's telephone numbers, or the class assignments of the pupils who are aboard a bus. A particular driver may know, but only because the driver may have transported the same children for some period of time. However, there is no system for identifying children or for contacting parents in case of an emergency. Area transportation supervisors report that when an accident occurs they (or whoever gets to the scene) have to go about asking pupils their names. One can imagine the consequences if a child were unconscious, in shock, or in need of serious emergency medical treatment.

Discussion

Lack of Information and Policies

It has been shown here that the Division of Transportation does not obtain information to plan adequately through the current school year and the summer for the opening of schools in the following September. Far too many other instances of lack of information or failure in communication are documented here. Area supervisors do not know who is authorized to ride buses, and drivers do not know either who is supposed to ride the buses or the names of the pupils who do ride. Principals do not receive information about buses and routes far enough in advance to be able to assign pupils to buses (as required by MCPS regulations) or to give parents accurate information about buses, routes, and schedules. Parents probably get at least as much for information about buses from the "neighborhood grapevine" as they do from principals or the Division of Transportation.

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[12] The question is reported in Exhibit 8.11 as asked. However, see the previous dicussion of drivers' comments on discipline and, in Part I, drivers' excellent evaluations of the condition of components of buses. Horseplay seems a more likely cause of injury than faulty equipment.

Though discipline is not a serious problem generally, it is a serious matter for drivers, individual pupils, and parents of pupils who may be penalized for misconduct on buses. Yet again, little information is exchanged. Drivers do not always inform principals about the need for disciplinary action until a case gets serious (and do not always know the name of an offender). All principals do not inform parents when a child is reported for an infraction of safety or conduct rules, nor do they always inform the Division of Transportation of the disposition of a case.

It has been shown that there are few MCPS policies or regulations that deal with these situations and few procedures that can be clearly understood and enforced. It was pointed out, for example, that principals are made responsible for assigning pupils to buses and for keeping up-to-date records of pupils' names, addresses, etc. They are not made responsible, however, for providing the Division of Transportation--the primary potential user--with this information.

Bus Service

Despite the problems discussed here, bus service is generally good. Lateness of buses on the way to school and departure of buses from school before all pupils have boarded are problems for parents, pupils, and school staff (see Chapter 4). However, in the larger picture, these are not major problems. It is probable that some buses will always be late for reasons beyond the control of administrators, supervisors, and drivers, and that this is a condition of service that has to be accepted. The problems of late buses and premature departure can be mitigated, however, if the Division of Transportation is given help in solving the large problems of planning routes and schedules and supervising drivers.

There is no reliable way for a driver to contact the division offices or shops when a bus is disabled. This has safety implications, and, as will be discussed in Chapter 18, inadequate communication can lead to unnecessary automotive services costs. The problem can be solved by equipping each bus with a two-way radio (division offices already have radios). Managers and supervisors of the division do not favor this idea. However, the topic is important and will be discussed again in Chapter 15 in the context of supports needed by the Division of Transportation.

Handling Complaints

It has been shown that while there is actually a low complaint rate, the Division of Transportation staff spend far too much time dealing with requests and complaints made by parents. Parents may call any of the 178 schools, three area transportation offices, and other MCPS offices for the resolution of a problem. Principals also call area transportation offices and the division's central office, and calls are made among offices by the division's own staff. All of this vastly multiplies the number of calls that have to be dealt with.

A single unit that handles all community relations and complaints is badly needed. Parents, principals, and others who need service or who want to make a complaint could call one number—hopefully one time—and the community relations staff would find a solution to the problem. This would drastically reduce the amount of time managers and supervisors (and principals as well) would have to devote to handling requests or complaints and free them to do other tasks which they are presently unable to do.

Recommendations

This chapter raises many very broad issues that go far beyond the day-to-day delivery of pupil transportation service: planning routes and schedules, the potential for reducing transportation costs through planning, the information needed by the Division of Transportation to carry out planning, determining pupils' eligibility for transportation, and many others that have an impact on costs. These issues need to be and are discussed as important topics in their own right. For example, Chapter 13 is entirely devoted to planning and the information needed for planning. Chapter 15 shows how the Division of Transportation can be given greater capacity for planning. Therefore, many recommendations which might seem appropriate here are made in these later chapters. The following, however, are based on the findings presented here:

- Until policies and procedures can be developed and the Division of Transportation has improved planning capacity, the following should be done:
  - Regulation 215-1 should be enforced: principals should be required to maintain up-to-date records for pupils who are transported by bus.
  - Principals should be required to provide copies of these records to the pupil transportation staff.
- The Deputy Superintendent's Office should develop a uniform procedure for principals to follow to inform parents of pupil's eligibility for transportation and bus routes and assignments. Principals should be discouraged from sending information to parents as early as June or too late to be useful.

- o The Division of Transportation should require drivers to take names and addresses of pupils who ride buses (until other procedures can be developed).
  - . Names and addresses should be taken and checked through September.
  - . At the end of September, drivers should submit correct lists to the transportation offices on forms developed by the division.
  - . Duplicate copies of the correct lists should be kept on buses.
  - . Lists should be updated and resubmitted (if changed) once a month.
- o All buses should be equipped with two-way radios to be used for emergencies (but see Chapter 15).
- o A central community relations unit should be created in the Division of Transportation to handle all requests for service and complaints (see discussion and details in Chapter 15).
- o Until appropriate policies and regulations are developed, the Deputy Superintendent's Office and the Division of Transportation should establish interim procedures for the uniform handling of discipline cases and exchange of information.
  - . The Division of Transportation should urge drivers to turn in disciplinary reports before cases become severe.
  - . Principals should be required to provide instruction to pupils on bus safety and conduct rules as required by MCPS Regulation 215-1.
  - . Principals should be urged to inform parents when a disciplinary report is turned in on a child and to inform parents of the possible penalties.
  - . Principals should be urged to inform the area transportation office of the action taken in each case within a day or two of the time the case has been resolved.
- o Form 555-3 should be made larger and more informative.

CHAPTER 9

BUS DRIVERS: TURNOVER, ABSENTEEISM, RECRUITING, AND TRAINING AS MAJOR STAFFING PROBLEMS

Introduction

Bus drivers are the "front line troops" of pupil transportation. Obtaining enough drivers, driver turnover and absenteeism, and recruiting and training drivers are not only major staffing problems for the Division of Transportation, but constant daily problems as well. The problem of obtaining substitutes daily is so important that the next chapter is devoted entirely to it.

Number Of Drivers Needed And Supplied

Inadequate FTE's

The number of full time equivalent (FTE) drivers allowed to the Transportation Division by the MCPS budget has increased regularly since FY 1975. However, as shown by the following data, the increase has not kept pace with increases in the number of buses on home-school-home routes or the total number of miles travelled by buses for all purposes:

	FY 1975	FY 1981[1]	Percentage Increase
Number of route buses	526	602	14
Millions of bus miles	7.95	9.82	24
Driver FTE's budgeted	358	406	13

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[1] Mileage data for FY 1982 are not available at the time of this writing. Though additional FTE drivers were allowed in the FY 1982 budget, the picture would actually change very little.

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Exhibit 9.1

DISTRIBUTION OF DRIVERS AND REASON FOR TERMINATION BY SEX: FY 1981

Distribution by Sex

	N	Percentage
Male	193	31
Female	431	69
TOTAL	624	100

Reason For Termination By Sex

	Percentage Male	Percentage Female
Accepted another job (private, government)	40	22
Moved	7	22
Personal reasons	5	2
Cannot work assigned hours	18	7
Left job, no reason given	7	7
Retired	13	15
Death	3	
Dissatisfied with job	7	2
Personal illness		5
Home responsibilities		10
Study		2
Other		5
TOTALS	100	100[a]

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[a] Rounding error = 1%

It must be remembered that it was shown in Chapter 6 that a large proportion of the increase in mileage is accounted for by field trips and special runs, many of which are done just as regularly as home-school-home runs. Therefore, a regular driver--in the sense that a run takes a given amount of time every day--has to be assigned to these runs. This is not taken into consideration in budgeting.

Turnover Among Drivers

Turnover Rate

As shown below, the turnover rate among bus drivers is 4 percent higher than the overall rate for all MCPS support services employees:

	Rate
All MCPS support services	9%
Bus drivers as of FY 1981	13%

In addition, while bus drivers represent 10 percent of all MCPS support services staff, they account for 14 percent of all support services terminations. Male drivers have a far higher turnover rate than female drivers. In FY 1981, they accounted for 50 percent of driver terminations, though only 31 percent of the drivers are male.

Reasons for High Turnover

Driving an MCPS school bus is a part-time job in which working hours are divided between early morning and late afternoon. Only those who are willing and able to work such hours take the position. In affluent Montgomery County, the job is therefore attractive primarily to people who need to supplement their own or the family's income: retired persons of either sex; young housewives who are not employed full time at another job; and those of either sex, but primarily males, who are employed full time by the police or fire department and who work shifts that permit "moonlighting." Circumstances change rather quickly (change of shift on full-time job, etc.) for these people, however, so they constitute an unstable work force.

Exhibit 9.1 shows both the distribution of bus drivers by sex (FY 1981) and the reasons for leaving the job that were given by those who terminated in FY 1981. Almost 70 percent of the drivers are women and just slightly more than 30 percent are men. Most of the men (40 percent) who terminated did so because they accepted another job or could no longer work the assigned hours (18 percent). Only 22 percent of the women terminated because they took another job, but 22 percent (as compared to only 7 percent of the males) moved and 10 percent left because of home responsibilities.

Absenteeism Among Drivers

Rate of Absenteeism

Area supervisors of the Transportation Division reported that 60 to 90 drivers, or between 10 percent and nearly 15 percent of the work force, are absent every day, though this includes both drivers who are absent and those whose positions are open because they have quit the job. This rate of absenteeism is probably not greater than that which occurs throughout MCPS generally.[2] However, because 60 to 90 buses would not go out on runs without drivers, absenteeism constitutes a severe problem for the managers of the division.

Absence Without Pay

While most leave taken by drivers is earned and approved (sick leave, etc.), a large proportion of it is absence without pay, as shown by the following FY 1981 data:

	Percentage of All Leave
Sick leave	64
Other earned or granted with pay	17
Absence without pay	19

Some absence without pay is approved: maternity leave, half-day meetings, etc. However, area transportation supervisors said that a significant proportion of absence without pay represents unapproved, unannounced, and unanticipated absence. They said that sometimes they do not know that a bus has not been taken out on its run until they are informed by a radio driver or even by the supervising automotive mechanic at the depot. (There is no dispatcher at a depot to take attendance and check on buses, and drivers do not report in to area offices.)

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[2] Because of the way MCPS keeps records, absenteeism data are extremely difficult to obtain by position category.

Recruiting Bus Drivers

Problems of Recruiting

Recruiting drivers is difficult and costly. Many of the reasons have been explained in the section dealing with the reasons for high turnover among drivers: Driving is a part-time job in which hours are split between early morning and late afternoon. Only those who are able to work such hours can fill the position. There are probably many individuals in the county who could work the required hours, but who do not need the income or the problems.

Geography plays a role here. Drivers are assigned to administrative areas, and when a position is open, it is in a particular area. In some areas, people are too affluent to be interested in driving part time. Sometimes an individual who is interested finds that she would have to travel up-, down-, or across-county four times a day (two round trips), because the open position is not in the area in which she lives.

Recruiting and Testing

Recruiting is not merely a matter of finding someone who is able to drive and is interested in the position. The Maryland State Department of Education (MSDE) specifies that the "prospective school vehicle driver" must meet the following preservice qualifications:

- Meet all licensing requirements of the Motor Vehicle Administration
- Have no more than two current points on the driving record and a satisfactory past driving record
- Complete the MSDE required preservice instruction
- Have no evidence of a criminal record
- Have five years driving experience
- Complete a physical examination
- Meet minimum requirements as determined by testing for night vision, field of vision, depth perception, reaction time, and steadiness

It is reported that many who answer recruiting advertisements run by the Department of Personnel Services do not have satisfactory driving experience or records. Some who have satisfactory records may fail one or more of the psychomotor tests administered by the Transportation Division's vehicle operator instructor. Finally, those who survive all screening must accept the fact that they face a training and probationary period.

Number Recruited, Trained, Hired

The turnover rate among drivers, as has been shown, is 13 percent. This means that each year about 80 drivers have to be recruited and trained as replacements for drivers who have quit. In addition, if the budget allows for an increase in FTE drivers, approximately double the number of FTE's must be recruited and trained. So, the addition of 18.5 FTE's in the FY 1983 budget means that about 37 new drivers have to be recruited and trained, bringing the total to about 117.

All recruits do not necessarily accept positions after they have been trained. For example, of the 148 who have already been trained in FY 1982, 16 completed training but did not take jobs. Therefore, more recruits have to be trained than are needed to fill the open positions. Finally, substitute drivers must also meet the qualifications laid down by MSDE. To maintain a pool of qualified substitutes, even more prospective drivers must be recruited and trained. This is why 148 individuals have already been trained in FY 1982 to fill approximately 117 positions.[3]

Training Drivers

Vehicle Operator Instructor

The vehicle operator instructor is a member of the Transportation Division's central office staff. He is responsible for administering the required psycho-physical tests to recruits, classroom training, and behind the wheel training. He is also responsible for evaluating accident reports to determine responsibility and to assess MCPS points (see later) if the bus driver is considered at fault. He is chairman of the Bus Accident Review Board and convenes the board in cases in which a driver appeals a ruling. It is important to note that the vehicle operator instructor is not responsible for required recertification training, which is arranged and given by area transportation supervisors.

The vehicle operator instructor does not have a staff which is housed permanently at the central office or which is under his direction at all times. However, some drivers have taken a course offered by MSDE that qualifies them to be driver trainers. At present, nine of these drivers give behind-the-wheel training under the direction of the vehicle operator instructor.

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[3] Figures are the best estimates which can be made on the basis of the information presently available. Obviously, the number of drivers recruited and trained varies from year to year. However, it is probable that these estimates will turn out to be conservative.

It is the impression of the MORE study staff that while the vehicle operator instructor has important responsibilities, the position has not been considered particularly important. At one time, the position was equal to that of an area transportation supervisor. Several years ago, it was graded lower than the grade of an area supervisor but higher than that of a transportation assistant. As has been said, the operator instructor has been given no staff and has little real control over the schedules of the drivers who help with behind-the-wheel training.

Training Required and Offered

Exhibit 9.2 compares the training required by MSDE and that which is offered by MCPS. At first glance, it would seem that MCPS offers more than is required. However, it should be noticed that MSDE recommends that new drivers be trained in very small groups (six per class). A number and variety of individuals have informed the MORE project staff that classes in MCPS have been nearly six times larger than recommended.[4]

After a driver has obtained the required operator's license and has served a six-month probationary period, annual in-service training is required for continued certification (Exhibit 9.2). Contrary to MSDE requirements, all drivers in any given area may meet together en masse for more than the permitted two hours, and the content of the training is not necessarily that approved by MSDE (see later observations and evaluation).

Training is given to drivers of special education buses at the various supplementary centers. This is in addition to the preliminary and continued certification training required by MSDE and is not under the control or supervision of the vehicle operator instructor.

Driver's Evaluations of Training

Exhibits 9.3 and 9.4 shows drivers' evaluations of training. In general, the required classroom training is not evaluated as highly as the behind-the-wheel training. Only 76 percent to 79 percent of the drivers said the amount of time allowed for classroom training, the way training was organized, and the way material was presented were good to excellent. In contrast, 85 to 87 percent said the amount of time given to behind-the-wheel training and the way in which the training was conducted were good to excellent.

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[4] Substitute drivers must go through all of the required training and pass all licensing requirements.

Exhibit 9.2

DRIVER TRAINING REQUIRED BY MSDE AND OFFERED BY MCPS

Type of Training	MSDE	MCPS
FOR NEW DRIVER		
Number of hours	Total of 15 hours	Total of 22-28 hours
	6 classroom 9 behind wheel	3 half-day classes 9-15 behind wheel depending on ability and previous experience
Required content	Bridge crossing Railroad crossing First aid	All required by MSDE plus defensive driving, accident review process, and other related topics
Class size recommended	6	5-10 (have actually been as many as 35 in class)
Other	1 behind wheel trainer for each trainee while on bus	Same
CONTINUED CERTIFICATION		
Hours	6 hours a year of which 5 may be in class, 1 behind wheel	2 meetings per year
Class size	35 or fewer. One large-group meeting not to exceed 2 hours	All drivers in area for one morning meeting of more than 2 hours
Content	Minimum as shown above for new drivers	Content varies by area

Substantial percentages (24 to 43 percent) of the drivers of special education buses gave low evaluations to the training they received at special education centers. Forty-three percent said the amount of time allowed was just adequate to poor. The staff at some centers were said to be inadequately prepared (24 percent). Twenty-three percent of the drivers said the material covered was not well organized or well presented.

In evaluating the extent to which the required training helped prepare them to perform the job satisfactorily, drivers again rated behind-the-wheel training more highly than classroom training. While 73 percent said they could not have performed the job satisfactorily without behind-the-wheel instruction, only 43 percent said this of classroom training. Between 27 percent and 33 percent of the drivers of special education buses said the training they received at special education centers was only of slight help or of no help in preparing them to deal with physically handicapped and emotionally disturbed pupils.

Despite what might be looked on as favorable evaluations of the required classroom and behind-the-wheel training, drivers' responses to questions about content raise serious questions about what is actually covered in the training. A large majority of drivers said that only a few topics were covered well: defensive driving (80 percent), how to inspect a bus (88 percent), and what to do if oil or water gauges or lights come on (73 percent). Other topics that would seem to be important were covered poorly or not covered at all according to drivers.[5]

Responses of drivers of special education buses also raise questions about the content of the extra training they are given. In no case did more than 60 percent say a given topic was well covered, which means that at least 40 percent said topics which would seem to be extremely important were not well covered or not covered at all. Because discipline on special education buses is a particular problem and because discipline and safety are closely related, it is disturbing to find that 52 percent of the drivers said that the topic was not covered at all (28 percent) or poorly covered (24 percent).

Continued Certification In-Service

Three observers of the MORE project team attended the continued certification in-service workshop for drivers in January, 1982. All of the drivers in an area met together in the morning for more than two hours, a clear violation of MSDE regulations. The content of the workshops varied considerably among areas, and some seemed irrelevant. In two areas, for example, members of the Employee Assistance staff made presentations (film, talk) in which they discussed the functions of their office. Such a presentation could have been

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[5] The questionnaire may not have included some topics which are well covered in the required training. However, it does seem, for example, that maintaining discipline is an important topic. Yet only 46 percent of the drivers said it was well covered.

Exhibit 9.3

DRIVERS' EVALUATION OF PRE-SERVICE TRAINING PROVIDED BY THE TRANSPORTATION DIVISION

General Ratings of Pre-Service Training	Percentage of Drivers[a] Good to Excellent	Just Adequate to Poor
o Amount of time allowed for classroom training	79	12
o The way classroom training was organized	76	13
o The way material was presented	77	12
o Amount of time for behind-the-wheel training	87	10
o How behind-the-wheel training was conducted	85	11

Ratings of Subject Areas Covered in Training	Covered Well	Not Well Covered	Not Covered
o Defensive driving	80	9	6
o How to tell (by sound or feel of bus) that damage could occur if bus were not stopped	59	22	14
o How to inspect your bus properly	88	5	2
o What to do if oil or water gauges/lights come on	73	16	4
o How to drive to obtain maximum fuel mileage	54	29	13
o How to maintain discipline	46	36	11
o How to deal with pupils' physical problems like fainting, car sickness, etc.	41	28	25
o How to deal with special education pupils' behavior problems	31	29	32
o How to deal with emotional needs or problems of special education pupils	30	29	33
o How to deal with physical problems of special education pupils	28	33	33

Contribution of Training to Performance of Job	Classroom	Behind-Wheel
o Could not have performed job satisfactorily without it	43	73
o Helpful but not essential	33	18
o Not essential and not helpful	1	0
o Mostly a waste of time	2	1
o No response (including drivers hired before pre-service training was required)	21	8

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[a] Totals not equal to 100 percent because of small percentages of no response.

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Exhibit 9.4

DRIVERS' EVALUATION OF TRAINING PROVIDED BY SPECIAL EDUCATION SCHOOLS OR SUPPLEMENTARY CENTERS

	Percentage of Drivers	
General Ratings of Training	Good to Excellent	Just Adequate to Poor
o Amount of time allowed	57	43
o How well prepared staff was	76	24
o How well material covered was organized	77	23
o The way material was presented	77	23
o Amount of time for drivers' questions	80	20
o How well drivers' questions were answered	80	20

Ratings of Specific Areas in Training	Covered Well	Not Well Covered	Not Covered
o How to meet the physical needs of physically handicapped pupils	57	20	23
o How to meet the emotional needs of physically handicapped pupils	60	23	17
o Causes and nature of emotional/ behavioral disturbance	47	33	20
o What kind of behavior to expect from emotionally/behaviorally disturbed pupils	57	33	10
o How to deal with the behavior of emotionally/behaviorally disturbed pupils	50	33	17
o Causes and nature of mental retardation	33	23	43
o How to meet the special needs of mentally retarded pupils	45	28	28
o How to maintain good discipline	48	24	28

Contribution of Training to Performance of Job	Physically Handicapped	Emotionally Disturbed
Very helpful or helpful	64	66
Of some slight help	16	17
No help	17	10
No response	3	7

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given to any MCPS group at any time and had nothing to do with any of the topics approved by MSDE. In another area, the transportation supervisor devoted a large part of the meeting to divisional business that again had little to do with driver training.

Need for Defensive Driving Refresher

Neither MSDE nor MCPS requires that drivers be given periodic in-service training in defensive driving. Yet in a memorandum to the acting director (in 1981) of the Division of Transportation, the vehicle operator instructor pointed out that it has been shown that "defensive driving skills are diminished after a three year period (and therefore) there is a need for periodic updating of driving fundamentals."[6] In view of the fact that MCPS has the highest school bus accident rate in the state, it seems curious that no action has been taken on this recommendation as far as can be determined by the MORE team.

Accidents And Training

By making the vehicle operator instructor responsible for evaluating accident reports, reviewing cases, assigning points to drivers, etc., the managers of the Transportation Division seem to recognize that there is a relationship between driver training and accident prevention. Recently, however, more emphasis has been put on field supervision than on training as a means of reducing the number of accidents (especially in the FY 1983 budget request to upgrade radio drivers to route supervisors).[7] However, it is quite possible that training could do as much or even more to prevent accidents than increased field supervision.

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[6] M. T. Fleming to Acting Director, Division of Transportation, January 28, 1981

[7] While field supervisors are sorely needed, there is some doubt that they can actually contribute very much to reducing the accident rate. See Chapters 12 and 15.

Number and Types of Accidents

The MCPS school bus accident rate is higher than the rates in Prince George's and Baltimore Counties, the two Maryland school systems that have approximately the same numbers of buses. The 1980 data are as follows:[8]

	Montgomery	Prince George's	Baltimore
Number of buses	602	703	604
Number of accidents	243	172	151
N accidents/N buses[9]	.40	.34	.25
Number of accidents deemed preventable	118	114	84
Preventable as a percentage of total	55	52	44

This does not mean that the buses are not safe for pupils. It was shown in Chapter 8 that fewer than 1 percent of the parents reported that their child had been injured while riding an MCPS school bus and that in many cases injury resulted from horseplay. However, the situation is serious and deserving of considerable attention, because there is always a thin line between a "fender bender" and a serious accident, with random chance seeming, at times, to be the deciding factor.

In FY 1981 there were 602 buses on routes and 244 accidents (a rate of .41). Eighty-three (34 percent) of the accidents were judged to have been non-preventable; 161 (64 percent) of the accidents were judged to have been preventable and the fault of the school bus drivers. Of these 161 preventable accidents, 71 percent were attributed to only the following five driving errors:

	Percentage of Preventable Accidents
Faulty distance judgment	22
Improper turning	21
Improper backing	15
Following too closely	7
Speed too fast for conditions	6
Total	71

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[8] M. T. Fleming, Memorandum, January 28, 1981.

[9] A comparative figure only, and merely a way of showing that if each accident involved a different bus, 40 percent of the MCPS fleet would have been in accidents. Based on M. T. Fleming's data but not quoted from memorandum.

Another 8 percent were caused by combinations of these errors, for example, following too closely at high speed. This means that nearly 80 percent of all preventable accidents were caused by these five common driving errors.

Analyzing Accidents and MCPS Points

A bus driver who is involved in an accident must have the police come to the scene and also call the area transportation office. An MCPS accident report must be submitted to the area office within 24 hours. The police report and the driver's accident report are reviewed and analyzed. If it is determined that the bus driver was at fault, MCPS points are assigned to the driver's record.[10] A preventable accident can be assigned between 3 and 15 points. If a driver causes an accident that is assigned between 8-14 points, the individual must either attend, without pay, a three-hour retraining program or go on suspension without pay for three days. A driver who causes a 15-point accident is discharged or placed in a non-driving position.

Retraining Program

Retraining, at present, is a "back to basics" program: psycho-physical testing and practice driving on a road course. There is some attempt to try to group together drivers who have had accidents of similar type, but this is not always possible. So far in FY 1982, 37 drivers have taken the retraining option. They report that the training is useful, at least partly because no other training is offered after the required pre-service training.

It does seem as if three hours is a very little time, especially since as many as 15 drivers may be in a group. In addition, there is no evidence that there is a direct relationship between the training given and that which may actually be needed, e.g., highly specific training in distance judgment, which is the error that causes 22 percent of all preventable accidents.

Finally, the vehicle operator instructor reported that a certain percentage of drivers accept the 3-day suspension without pay instead of the three hours of retraining. This hardly seems logical from a financial point of view, but perhaps other considerations come into play: inability to attend the retraining session at the time it is offered or unwillingness to be "stigmatized" in public or to be part of a group that is being disciplined.

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[10] The MCPS point system (Regulation 215-2) is an internal one and has nothing to do with the Maryland Motor Vehicle Administration point system.

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Discussion

Driver Turnover

Given the nature of the job, it is probable that MCPS must continue to accept a high rate of turnover among bus drivers. However, it is possible that some attempt could be made to reduce turnover by changing recruiting tactics (see below). It may also be possible to combine some part-time positions in such a way as to create the equivalent of full-time positions. For example, an individual might be able to drive a school bus and also fill a part-time office or cafeteria position.

Absenteeism

Because MCPS has liberal leave policies like those in other governmental agencies, nothing can or should be done about approved absenteeism. However, despite the difficulty in recruiting, training, and holding drivers, Transportation Division administrators and supervisors should discipline and, if necessary, discharge drivers who frequently take unapproved and unannounced leave.

Recruiting

Recruiting, turnover, and absenteeism are closely interrelated and are major problems for the Transportation Division and MCPS. The Department of Personnel Services may be able to take some steps that could improve recruiting and reduce turnover and absenteeism. For example, students attending local colleges might be interested in and able to fill driving positions. Advertisements for drivers might be put in the small newspapers--the ones that are local and distributed without cost--in less affluent neighborhoods.

Training

At present, responsibility for training is widely scattered and the training itself is not coordinated. The vehicle operator instructor is responsible for pre-service training and for the very short three-hour refresher course drivers may attend after they have had a serious accident. Area transportation supervisors are responsible for continued certification training. Principals of special and alternative education centers are responsible for supplementary training of drivers of special education buses.

Drivers' evaluations suggest that the training provided by the Division of Transportation is not always adequate and that many important topics are not covered. The required continued certification workshops are largely a waste of time and money. There is a serious need to coordinate and improve the supplementary training for drivers and aides of special education buses, particularly since the FY 1983 MCCSSE agreement with the Board of Education requires that special education drivers and aides receive training appropriate to the requirements of the job.

All of the evidence shows that there is a need to improve and coordinate all driver training. This very large task cannot be done by one individual. The vehicle operator instructor must have a permanent staff. Even then, the Transportation Division will need the help and cooperation of other units to develop and carry out a truly effective training program, particularly the help of the Department of Staff Development and the Office of Special and Alternative Education.

Accidents

MCPS policies and procedures do not deal adequately with accidents. For example, a driver who causes an 8 to 14 point accident should not be given the option of either attending a 3-hour course or taking a 3-day holiday (even though it be without pay). A driver who causes a 15-point accident should be required to attend a longer remedial training course or be discharged.

Transportation Division managers seem to be relying on improved supervision to reduce accidents. Yet at least three of the five major errors that account for 80 percent of all driver-caused accidents do not seem to be those that will be prevented by increased supervision: faulty distance judgment, improper turning, and improper backing. It is doubtful that the other two, tailgating and excessive speed, will be much affected by increased on-the-road supervision.[11] All five, however, are precisely the errors that can be corrected by a combination of intensive classroom training, supervised practice, and periodic retraining in defensive driving. There is a need, therefore, to coordinate accident investigation, remedial training, behind-the-wheel training, and supervision.

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[11] This is not at all an argument against the need for more bus route supervisors.

Recommendations

Number of Drivers

- o The Transportation Division should be granted the number of FTE drivers for which the division can document a need. Documentation should include evidence that all reasonable effort has been made to avoid adding buses or runs.
- o The substitute account should not be used to pay regular drivers for runs done daily, provided that the budget allows an adequate number of FTE drivers.

Recruiting and Driver Turnover

- o Under the aegis of the associate superintendent for Supportive Services, the Department of Personnel and the Transportation Division should form a task force to examine, make recommendations for, and implement the following:
  - . One or more trial recruiting campaigns aimed at those who might be able to and be interested in driving a school bus
  - . Changing the type and location of recruiting advertisements
  - . Creating "full-time" positions by combining part-time positions
  - . Interviewing in depth bus drivers who leave the position to determine real (as opposed to formally stated) motives and to determine their bearing on recruitment and driver turnover
- o On its own, the Department of Personnel Services should review its recruitment and hiring procedures and forms to determine if it is possible to reduce the time it takes to hire bus drivers.

Absenteeism

- o The Division of Transportation payroll procedure should be simplified to make it possible for administrators and supervisors to keep useful attendance records.
- o When a simplified payroll system is in place, the Division of Transportation supervisors and administrators should monitor the records of drivers who frequently take unapproved leave and discipline or discharge these drivers.

Training

- The position of vehicle operator instructor should be upgraded to a level equal to that of a present area transportation supervisor (see Chapter 15).

- The vehicle operator instructor should be made responsible for and given an adequate staff to carry out the following (see Chapter 15):

  - Psycho-physical screening of driver recruits
  - Providing all classroom, on-the-road, continued certification, remedial, and other training offered by the Transportation Division
  - Coordinating training in special education for drivers of special education vehicles
  - Accident investigation, including on-the-scene investigation, and accident review

- Until another task force (see below) is formed and functioning, the Transportation Division should immediately form an internal task force under the chairmanship of the present acting vehicle operator instructor and consisting of an area transportation supervisor, one senior driver, one new regular driver, one special education driver who has recently received supplementary training, and one supervising automotive mechanic. (Part-time drivers to be allowed duty pay.) The task force should perform the following tasks:

  - Review the material on training in this chapter
  - Review present training procedures and content
  - Make recommendations for procedures and content

- A task force and permanent committee should be formed under the aegis of the associate superintendent for Supportive Services, chaired by the vehicle operator instructor, and consisting of a representative of the Office of Special and Alternative Education and a representative of the Department of Staff Development. The functions of the task force and permanent committee should be to:

  - Determine MCPS training resources which are needed for all driver training and which are available or can be made available
  - Arrange for all in-service training which involves persons or resources outside the Division of Transportation
  - Collect (vehicle operator instructor and staff) and review (committee) data which have implications for training and arrange for additional training shown to be necessary.

Accidents

- o In Chapters 6 and 7 it was recommended that an upper echelon team should review MCPS policies and procedures. That team should include in its reviews regulations that deal with school bus accidents, points, and penalties. When necessary, additional regulations and procedures should be written, especially to cover the following:
  - . Required attendance without pay of a remedial training program (perhaps 10 to 20 hours) by drivers who have serious accidents or accumulate given numbers of points (if accidents are judged driver's fault)
  - . Discharge of drivers who cause a given limited number of preventable accidents or accumulate a given number of points
- o Until regulations are modified or rewritten, the Division of Transportation should uniformly enforce all MVA, MSDE, and MCPS laws, by-laws, and regulations governing accidents.

CHAPTER 10

THE NEED FOR SUBSTITUTES AND A PROPOSAL FOR A RELIEF DRIVER POOL

Introduction

Finding enough substitutes to take the buses and runs of the many regular drivers who are absent each day is a constant, grinding chore for everyone in the three area transportation offices. It takes up staff time that could be better devoted to other jobs like route planning and supervision. In addition, it is not reasonable to expect day-by-day substitutes to do anything except drive, an essential job, but one which does not help solve any of the division's administrative or supervisory problems. By forming a permanent pool of relief drivers, MCPS can obtain more benefits from the $300,000 to $500,000 spent annually on substitutes' salaries. This proposal will be discussed after the various administrative problems caused by the present substitute system have been described.

Administrative Problems

Recruitment, Training, and Retention

Announcements of the need for driver substitutes are typically made in advertisements of bus driver positions (e.g., need school bus drivers and substitute drivers). Thus some individuals are recruited only as substitutes. Others are recruited as drivers and serve as substitutes until a position is open. Sometimes, a regular driver may resign and ask to be put on the substitute list. Whatever the case, substitutes must be treated exactly like driver candidates and meet all MSDE standards. This means they must pass the psychomotor tests, successfully complete pre-service training, and be licensed.

Substitutes are paid out of the substitute account and do not earn benefits like paid leave, retirement, etc.[1] The Department of Personnel Services reports that it is difficult to retain substitutes because they are trained drivers and want permanent status, benefits, and a chance for salary increases.

Staff Time

The time-task survey done at the area transportation offices (Appendix A) showed that all six of the transportation assistants spend some time on the telephone making calls to and receiving calls from substitutes. The average was 9 percent of a normal 40-hour work week, or, for all of them combined, almost 22 hours a week. The range was 2 to 17 percent, depending in part on the administrative area, or, for given individuals, from one hour a week to as many as seven hours. This does not include time devoted to talking with the drivers who called in to say they were going to be absent, and there was no way to sort out these data from other calls to and from drivers. It was reported, incidentally, that it takes an average of about three telephone calls to obtain a single substitute.

The time-task study was deliberately done in a week between support service payrolls. However, the three area office clerks devoted from 10 to 14 percent of the entire work week to the substitute payroll, with an average of 12 percent. In addition, the substitute payroll is also worked on by the area office secretaries and the central office secretary.

Performance of Substitutes

Large percentages of principals, as shown by the following questionnaire data, gave adverse evaluations of the performance of substitute drivers:

Question	Percentage Responding "Yes"
Do substitute drivers elicit more complaints about operations (lateness, etc.) from parents than do regular drivers?	50
Do more parents or pupils complain about discipline on a bus when there is a substitute driver than when there is a regular driver?	45

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[1] Though MCPS incurs a "fixed cost" of about 10 percent of salary for anyone hired and paid even for a day.

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There is good reason why substitutes elicit more complaints about lateness than regular drivers. Regular drivers are supposed to keep a current description of each route or run in their buses, but area supervisors reported that some do not do this at all and that others do not keep the description up to date. Therefore, substitutes may get either no information or confusing, out-of-date information about routes. On questionnaires, some parents commented that substitutes sometimes have to ask pupils to point out routes and stops.

An Informal System

In all three area offices an attempt is made to make the job of getting substitutes less burdensome and time consuming. Substitutes who call in to say they are available are guaranteed and paid for one hour of work. A substitute who shows up at a depot is guaranteed and paid for two hours of work. In the extremely unlikely event that they were not needed, they would be paid anyway. This is a very small price to pay for an informal "substitute pool," and the savings in administrative costs and time may be greater than the amount spent in the course of a year. There was a time, in fact, when the Division of Transportation was allowed to have such a pool, and, it is reported, there was not the same substitute problem as there is today.

Number of Substitutes Needed Daily

Determining how many substitutes are needed daily is not a straightforward matter. The number of regular drivers absent on any given day is known, but the number of substitutes who have to be called in is not equal to the number of drivers who are absent. For example, a driver might take one of three morning runs, go home because of illness, and not be available to take a kindergarten and three afternoon runs. At least one substitute would have to be called in to take the two remaining morning runs, the kindergarten run, and the three afternoon runs. But substitutes are not always available for all runs, so two or even three substitutes might have to be called in to cover the open runs of one regular driver.[2]

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[2] Because there are so many possible permutations of open runs, special runs, buses, drivers, and substitute drivers, the payroll is very complex and time consuming.

MORE Staff Estimate

To get some idea of how many substitutes are needed daily, the MORE project staff took an every-third-day sample of records in one area for FY 1981 and generalized results to all five of the areas that existed at the time. On the average, there were 57.5 "open routes" a day. Or, to put it another way, every day about 58 buses which are assigned to some route or run would not have moved off the depot lot if substitutes had not been found. The maximum number on any one day was 80.

Area Offices Estimates

Area transportation supervisors say they must call in between 60-90 substitutes each day. The 60 agrees with the estimate of 58 made by the MORE staff, but the range and the estimated high do not. Therefore, the project team asked two area transportation supervisors to pick five-day records for FY 1982 at random and to count the number of routes that had to be covered and the number of substitutes called in. In this case, the average number of substitutes required daily was 81, and the highest number in any single day was 105.

The Best Estimate

There is a difference of 23 substitutes per day between the average number estimated by the MORE project staff and the number estimated by the transportation supervisors, or an average of 8 per area per day. It is probable that this can be explained by the fact that the samples on which averages are based are from two different years, the latest being the supervisors' estimates made in FY 1982. There are now more drivers and more buses than in FY 1981, and buses are being driven more miles on more runs of all kind.

There is reason to believe that an average of between 80 and 85 substitutes a day is the best estimate that can be obtained at this time. In the previously quoted memorandum dealing with the substitute account, the director of the Transportation Division showed that about half of all substitute money, about $410,000, will be spent for substitutes to cover open runs. The typical regular driver is assigned four hours a day, and substitutes are paid about $6.20 an hour. However, regular drivers who are paid more than that sometimes serve as substitutes. Therefore, $6.50 per hour can be used in the following calculation:

Expenditures for substitutes = $410,000 per year
$410,000/185 school days = $2,216 per day
$2,216/6.50 per hour = 341 hours per day
341/4 hours per driver = 85 substitutes per day

This is very close to the estimate of 81 arrived at by the area transportation supervisors by another entirely different method.

A Proposal For A Permanent Relief Driver Pool

Taking all findings into account, the MORE team believe that both the Transportation Division and MCPS would derive many benefits from the establishment of a relief driver pool. It should be understood that while the number of positions, costs, and other details presented here constitute an example based on certain assumptions, the idea of a relief driver pool should be considered as a means of solving some of the problems that now confront the division.

The Proposal

It is proposed that a new permanent position with two grades be created and that the titles Relief Driver I and Relief Driver II (or something similar) be used to distinguish these staff members from day-by-day substitutes. The positions would be defined as follows:

Relief Driver I	4 hours per day	199 days
Relief Driver II	8 hours per day	199 days

While it would be possible to express the number of relief drivers in FTE's, this would be undesirable. Rather, the number of positions should be fixed to prevent "juggling" of hours and to guarantee that an individual has a regular position with an assured number of hours per day.

Relief Driver I positions would be filled by the best of the driver trainees who have just completed training and are waiting for assignment as probationary drivers. The salary for the position would be the starting wage for regular drivers. Relief Driver II positions should be considered promotional and should be filled by experienced regular drivers. As will be discussed later, Relief Drivers II would be given some supervisory responsibilities, and therefore the position should be higher than that of regular driver.

Relief drivers would be assigned to transportation depots and to open runs in the same way substitutes are now assigned to open runs and buses. A small number of Relief Drivers I could be assigned to the Shady Grove depot as "floaters" to be dispatched to other depots when necessary.

Cost Comparisons

Exhibit 10.1 compares the present substitute salary and administrative costs of hiring 80 4-hour substitutes a day with the salary costs of a permanent relief driver pool. The following assumptions underlie the computations:

- The best obtainable estimate is that between 80 and 85 substitutes are called in daily for 185 school days. All do not necessarily drive for a full four hours a day. Therefore, the lower estimate of 80 is used in the comparison.
- The number of relief drivers (60 4-hour, 5 8-hour) is the same as an FTE of 70 four-hour drivers. Since the four-hour drivers would be available both morning and afternoon and the eight-hour drivers would be available all day, it is assumed that they would equal a work force of 80 substitutes.
- Relief Drivers I would be paid the starting salary of $6.20 per hour. The average salary of $7.00 per hour is used to calculate costs for the positions of Relief Drivers II. Because they would be permanent staff, both groups would qualify for paid holidays and thus be paid for 199 days per year as 10-month employees.
- The relief driver pool would almost entirely eliminate the need for transportation assistants to devote time to call in substitutes and would eliminate the large and complex substitute payroll.
- The time-task study showed that 9 percent of the time of transportation assistants, and hence 9 percent of their salaries, are devoted to calling in substitutes. Not all time was accounted for, so 10 percent can be considered a reasonable estimate.
- Supervisors said that it takes an average of 3 telephone calls to obtain one substitute. At 9¢ per call, the annual cost of calling 80 substitutes per day is about $3,888.
- The time-task study showed that 12 percent of the clerks' time and salaries are devoted to the substitute payroll.

Given these assumptions, it can be seen in Exhibit 10.1 that the present annual cost of 80 substitutes is about $426,015. The salary cost of a relief driver pool would be about $439,790 per year, approximately $13,775 more than the cost of substitutes. As will be shown later, however, the benefits derived would far outweigh this very modest increase in costs.

Exhibit 10.1

COMPARISON OF PRESENT COST OF 80 SUBSTITUTES AND OF THE COST OF A RELIEF DRIVER POOL

Present Cost Of 80 Substitutes Per Day

80 substitutes at 4 hours per day, 185 days a year, at $6.20 per hour plus 10 percent fixed costs to MCPS	$403,744
Transportation Assistants' (6) salaries of $128,107: 10 percent devoted to calling in substitutes + 25 percent fringe benefits, corrected to 10 months	13,344
Clerks (3) salaries of $40,309: 12 percent devoted to substitute payroll + 25 percent fringe benefits, corrected to 10 months.	5,039
Annual telephone cost to obtain 80 substitutes per day	3,888
TOTAL ANNUAL COST	$426,015

Salary Cost Of Relief Driver Pool

60 four-hour drivers at $6.20 per hour for 199 days + 25 percent fringe benefits	$370,140
5 eight-hour drivers at $7.00 per hour for 199 days + 25 percent fringe benefits	69,650
TOTAL ANNUAL COST	$439,790

Difference In Costs[a]

Present cost of 80 substitutes per day, 185 days	$426,015
Salary cost of relief driver pool, 199 days	439,790
DIFFERENCE	$ 13,775

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[a] Does not account for fact that it is probable that a small number of substitutes may have to be called in even when there is a relief driver pool.

Potential Benefits of a Relief Driver Pool

Transportation Assistants' Time

On the average, each transportation assistant would gain about 4 hours a week, one half of a work day, by being released from the job of arranging for substitutes. Since there are 6 assistants, the Transportation Division would gain the equivalent of 3 additional work days a week, or 111 days in a school year. In Chapter 12, it will be shown that many supervisory jobs are not being done (direct supervision of drivers, route and schedule planning, etc.) and that in some cases MCPS does not provide the supervision required by MSDE. The gain of more than 100 days a year would enable supervisors to do some of these necessary jobs, which, in turn, might reduce pupil transportation costs.

Payroll, Reimbursement, Clerical Time

Relief drivers would be permanent employees, paid for a specific number of hours a day. Their payroll would be like other supporting services payrolls in other units and therefore vastly more simple than the present substitute payroll. Provided that other needed controls were instituted, it would become possible to attribute accurate salary costs to programs that use transportation services. As was discussed in Chapter 6, this could increase the reimbursement MCPS is entitled to from other government agencies.

On the average, each of the 3 clerks would gain nearly 5 hours a week, or more than half a working day. The Transportation Division would thus gain almost 2 additional work days a week, or about 70 work days a year. Again, many jobs that are not presently being done or for which there are serious backlogs could be done in this additional time.

Jobs for Relief Drivers

Day-by-day substitutes cannot be expected to do anything but drive. However, as permanent employees, relief drivers could be assigned a number of important jobs at the depots and even on buses when they are driving. When not driving, Relief Drivers I, for example, could do the following jobs that are not being done regularly or that take up the time of supervisors: take a spare bus to the scene of breakdown and transport children to school, clean and inspect buses, perform minor clerical tasks at the depot, etc. When driving, they would, of course, be learning the routes, runs, and schedules in the depot area.

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Relief Drivers II could be given even more responsibilities, including supervisory responsibilities. The following are examples:

- While driving, they could[3]
  - Learn all routes in depot area
  - Map routes and check routes for efficiency
  - Check safety of bus stops
  - Take bus load counts
  - Check operation of bus

- When not driving, they could
  - Assist in training new drivers
  - Check odometers of buses to control unapproved personal use
  - Check buses off of and onto depot lot
  - Make certain that drivers perform pre-trip inspections

Senior relief drivers, as 8-hour employees, would thus give the division the equivalent of additional supervisors.

Improved Performance

In a relatively short time, relief drivers should come to know the routes and runs in their depot's area quite well. In addition, the pupil transportation office staff should be able to keep abreast of route modifications, and supervisors should be able to enforce the requirement that there be route descriptions on each bus. All of this should reduce, if not entirely eliminate, the problem now experienced when day-by-day substitutes who do not know the routes and runs are employed. In turn, parents' and principals' complaints should be minimized.

Recruiting, Retention, Promotion

The creation of permanent relief driver positions should solve some of the problems of recruiting, training, and retaining both substitutes and regular drivers. The most competent of the newly trained drivers could move immediately into permanent Relief Driver I positions with guaranteed hours. Relief Driver II positions would be promotional positions for all drivers. In addition, Relief Drivers II would be in line for promotion to supervisory and managerial positions.

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[3] It is assumed here that they would have printed checklists (for safety of bus stop for example) and that they would turn in reports to supervisors.

Discussion

The present system of obtaining substitutes interfers with the ability of the pupil transportation staff to do some of the jobs that could save money for MCPS and creates operational problems. At a very small additional cost (about $14,000), a relief driver pool could increase the potential for improving the efficiency of the entire pupil transportation staff and provide the division with additional supervisors. As was said earlier, it is the idea of the reflief driver pool that is important here, not the particular number of relief drivers given in the computational example. However, the 60 4-hour drivers and 5 8-hour drivers suggested here would apparently provide a favorable balance of hours and staff in relations to estimated needs.

Recommendations

- As soon as possible after the publication of this report, the Division of Transportation should begin to keep daily records of the number of substitutes needed, number of runs to be covered, and other relevant data.
  - This data collection should intrude as little as possible on ongoing operations tasks.
  - Desirably, the division should be provided with a temporary staff and funds to carry out this recommendation.
- An internal committee of the Division of Transportation should carefully study the recommendation for a relief driver pool presented here and, on the basis of available data, determine the numbers of Relief Drivers I and II needed to meet the daily substitute needs of the division.
- The Department of Personnel Services should develop, in cooperation with the Division of Transportation and the Office of Supportive Services, the recommendations needed for relief driver positions to be approved by the Board of Education.

CHAPTER 11

BUS ATTENDANTS

Introduction

In FY 1982, the Division of Transportation employed 102 FTE bus attendants (better known as aides). They are assigned only to special education buses. Neither MSDE nor MCPS requires that aides be assigned to these buses, though MSDE by-laws do state that a school system is permitted to hire aides. Before instituting block funding, MSDE paid a portion of their salaries, but no longer does so directly.

As with drivers, the Division of Transportation has to deal with aides' turnover, absenteeism, recruitment, training, and performance. However, while a bus cannot move from the depot lot without a driver, it can be taken on its runs without an aide. The problems are therefore of a different magnitude.

Trends And Number Of Aides Needed

In FY 1975, the FTE of 48 aides was allowed in the budget. The FY 1982 budget allows an FTE of 102 aides, an increase of 113 percent over FY 1975. The number of aides has increased with increases in the number of pupils in special and alternative education and the number of special education buses. Since there are no standards for assigning aides to buses, there is no way to determine how many aides are needed by the Transportation Division or if the present number is adequate.

The decision to employe aides at all is, at present, a policy decision, and two extreme positions can be taken. It could be argued that an aide should be assigned to every special education bus. On the other hand, since neither MSDE nor MCPS requires aides, nearly $1-million could be saved annually by abolishing the position altogether. The Transportation Division has tried to establish a reasonable position between these extremes. An aide is not assigned to every special education bus. Instead, the aides allowed by the budget are assigned first to buses which carry pupils who have severe physical or emotional handicaps, including to all buses equipped with wheelchair lifts. Only after aides have been assigned to these buses are the remaining

Exhibit 11.1

DISTRIBUTION OF BUS AIDES BY SEX AND REASONS FOR TERMINATION FY 1981

Distribution By Sex

	N	Percentage
Male	3	2
Female	123	98
TOTAL	126	100

Reasons For Termination[a]

	Percentage
Abandoned position	32
Accepted another job	13
Moved	10
Could not worked assigned hours	10
Home responsibilities	10
Personal illness	10
Retired	5
Death	5
Dissatisfied	5
TOTAL	100

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[a] Because 98 percent of the aides are women, breakdown of terminations by sex would be badly misleading.

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aides given assignments. During the course of the school year, if there are enough FTE positions and funds, an aide may be assigned to a bus after an unanticipated problem has surfaced.

Recruitment, Turnover, Absenteeism, And Substitutes

Recruitment

The problems in recruiting aides are the same as those that make it difficult to recruit drivers. Hours of work are limited, generally to four hours, and split between early morning and late afternoon. In addition, aides are paid between $4.68 and $5.95 an hour. For a 4-hour aide, this amounts to between $3,463 and $4,403 for 185 school days--not a lavish sum in affluent Montgomery County.

Turnover and Reasons for Leaving

The turnover rate among aides is higher than among bus drivers and all other MCPS support services employees:

	Rate
All MCPS support services	9%
Bus drivers	13%
Bus aides	17%

Exhibit 11.1 shows the distribution of aides by sex and the reasons those who left the job gave for quitting. The vast majority (98 percent) of aides are women. Of those who resigned in FY 1981, 32 percent abandoned the job, i.e., simply did not report for work one day and did not return.[1] Twenty-five percent left because they had home responsibilities, could not work the assigned hours, or were dissatisfied with the job.

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[1] Compared to only 7 percent of the drivers, the majority of whom are also women, who abandoned the job. Leaving the job in this way is obviously related to the position, not to sex.

Absenteeism

As shown below, aides take a lower percentage of leave without pay than drivers. However, 14 percent is still a rather high rate and can be a serious problem when the absence is not anticipated and not approved.

	Percentage of All Leave	
	Aides	Drivers
Earned leave or granted with pay	86	81
Absence without pay	14	19

Substitute Aides

Since a bus can be taken on the road without an aide, the need for substitute attendants is not as critical as the need for substitute drivers. Obtaining substitutes is a problem, however, part of which is a matter of "mechanics". Many drivers of special education buses have to start their runs by 6:30 a.m. The earliest time at which an aide can call the area office to say she will not report for duty is 6:00. Telephone lines are often busy, and the aide cannot get through until the bus is ready to leave without her. At other times, the office staff cannot, in the time available, take a call from an aide who will be absent and make calls to substitutes. Finally, there are times when aides do not call in at all. No matter why it occurs, buses do leave without an aide aboard.

Training

It seems logical that bus aides, who are going to work with and give help to some of the most severely physically and emotionally handicapped pupils in MCPS, should be well trained to do the job. In practice, however, many newly hired aides who step onto a special education bus for the first time in September have virtually no training. MSDE requires only two hours of pre-service training for aides. However, in MCPS newly hired aides attend a meeting for bus drivers held just before the opening of schools. By no stretch of the imagination can this meeting be considered the equivalent of job training.

Some aides--but apparently not all of them--attend the training sessions given at special education centers. This training was described and evaluated in Chapter 9. Because there is no coordination of the training and because important topics are not covered, it cannot be considered adequate.

Supervision Of Aides

Though supervision is one of the major topics addressed in Chapter 12, it is appropriate to mention supervision of bus attendants here. Aides are at the very bottom of the managerial-supervisory-worker structure, far removed in every way, including physically, from area transportation supervisors. The driver is in the position of the captain of a ship, in charge of what happens and responsible for the life and safety of passengers and crew. In effect then, the driver, who works closely with the aide every day, is the aide's immediate superior and supervisor. But the driver has little real control over the aide's conduct or performance and does not evaluate the aide. Instead, the area transportation supervisor does the evaluation, even though he may not know or observe the aide. Transportation supervisors and assistants also settle disputes between drivers and aides, again despite the fact that they may know little about the situation. Even if supervisors were able to observe and evaluate aides, standards of evaluation become almost meaningless if aides are not well trained to begin with or if they have no opportunity to get the training they need to improve their performance.

Evaluations Of Aides' Performance

Parents' Evaluations

Exhibit 11.2 gives the percentages of bus drivers and parents of special education pupils who responded in given ways to questions about some aspects of the performance of aides.[2] Substantial percentages of parents (37 percent, 34 percent) said they could not judge whether or not aides take care of the needs of special education pupils or maintain good discipline.[3] However, the majority said aides do care for children's needs (57 percent) and help maintain good discipline (64 percent).

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[2] It is important to remember that there is probably some sampling bias. Only drivers whose buses are assigned aides and parents whose children ride buses to which aides are assigned could respond to the questions. They represent a small sample.

[3] Good discipline while the bus is in motion is a matter of safety, not necessarily an end in itself.

Perhaps more to the point is the fact that many of the parents of special education pupils wrote comments about the aides. These comments reflect mixed, and sometimes diametric opinions. The following are examples:

- The aide on my son's bus is terrific!
- I was hesitant to put my young daughter on a bus, but the aide makes her feel at ease.
- The aide is exceptional in the concern and care she gives.
- The aide often sleeps on the bus.
- The aide does not know how to deal with emotionally disturbed children.
- My son's aide has been abusive, using harsh language and forcing children into their seats.
- The aide is intimidated by the bigger children.

It is probable that all of these evaluations are accurate. In any group of untrained and largely unsupervised people, there will be some who display a "natural ability" to do the job well and others who do not.

Drivers' Evaluations

Depending on the question, between 72 percent and 88 percent of the drivers said the aides are always helpful and that they do the jobs they are presumably hired to do. However, as shown in Exhibit 11.2, between 12 percent and 28 percent of the drivers said the aides perform important tasks only sometimes, rarely, or never. This is disturbing because the tasks listed are not only those which the aides should perform, but are also those that contribute to safety while the bus is in motion. For various reasons, the MORE project staff got the impression that while some drivers and aides work well together as a team, good will does not always prevail. This was expressed by one driver who does not have an aide and who wrote, in very large and emphatic block capitals, "Keep aides off of my bus!!"

A Problem Of Control

The Mark Twain program serves pupils who have complex emotional and behavioral problems. According to managers of the Transportation Division, the school staff have often complained that rules of conduct are too strictly enforced on the buses that serve the school. They say this aggrevates emotional problems that have to be dealt with in school. Not surprisingly, in view of what has

Exhibit 11.2

EVALUATIONS BY PARENTS AND DRIVERS OF SOME ASPECTS OF BUS AIDES' PERFORMANCE

Special Education Parents[a]

Question	Response	Percentage Of Parents
Does the aide take care of your child's special physical and/or emotional needs?	Yes	57
	No	6
	Cannot judge	37
Do you believe the aide helps maintain good discipline on the bus?	Yes	64
	No	3
	Cannot judge	34

Special Education Bus Drivers[b]

Question	Response[c]	Percentage Of Drivers
DOES THE AIDE ASSIGNED TO YOUR BUS:		
Help the physically handicapped get on and off the bus?	Sometimes, rarely, or never	12
Help pupils who need assistance while the bus is moving?	Sometimes, rarely, or never	18
Make pupils stay in their seats?	Sometimes, rarely, or never	16
Control noise so you can drive safely?	Sometimes, rarely, or never	28
Prevent fighting or physical abuse?	Sometimes, rarely, or never	17

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[a] Only parents whose children ride buses to which aides are assigned

[b] Only drivers to whose buses aides are assigned

[c] All possible response choices are not given. Between 72 percent and 88 percent of the drivers replied always (i.e., always helps....) to the questions.

already been said, the school staff also say that the bus aides provided by the Transportation Division are not adequately trained to work with Mark Twain pupils and that they can cause behavioral problems.

In FY 1982, school administrators asked the special education aides who work at the school to serve as bus aides. Agreement had to be volunary, because the assignment is not included in the job description of special education aides. Six of them volunteered and have been serving as bus aides.

In FY 1983, Mark Twain continued to supply its own bus aides. In addition, the school, in effect, has its own bus driver substitute pool. That is, the Transportation Division has desiguated two substitutes per area to be assigned to Mark Twain buses before being considered for other assignments. Regular drivers of the buses that serve Mark Twain work at the school for one hour a day. They are paid by the Transportation Division, but the division is supposed to be reimbursed for salary costs by the school.

As matters now stand, then, the Transportation Division is responsible for the buses and drivers that serve the school. The drivers are responsible for the safety of buses and passengers and, by MCPS regulations, for enforcing conduct (safety) rules. Bus aides are assigned by the school and are more under the control and supervision of the school staff than of the pupil transportation staff. Drivers are not under the supervisory control of the Transportation Division during the time they work at the school. If the work they perform is to be looked on as training, then the training is not coordinated or supervised by the pupil transportation staff.

Discussion

Number of Aides and Need for Policies

No evidence was found in the course of this study that it is necessary or even desirable to assign an aide to every special education bus. Many of the physically handicapped need little or no help getting on and off a bus. Many of those who are not physically handicapped behave quite normally while riding buses. Not only do these pupils not need the help of aides, but to assign aides to care for them might convey the erroneous impression that they need a keeper. On the other hand, some pupils, because of the severity of their physical or emotional handicaps, do need the help and care of aides. That help should be provided.

At present, no MCPS regulations address the issues of whether or not aides are to be assigned to special education buses at all or what criteria should be used to determine whether or not an aide will be assigned to a given bus if aides are considered necessary. Yet these are questions of policy which cannot be ignored.

Recruiting

In Chapter 9, it was pointed out that recruiting drivers, turnover, and absenteeism are related. The same thing is probably true for aides. It would therefore seem reasonable to recruit individuals for whom the split hours of employment might be favorable. Many students at Montgomery College are enrolled in programs that equip them to serve as aides on special education buses: Mental Health Associate, Handicapped Assistant, Child Care, Recreation Leadership, and Education. The first two programs require that the student participate in a practicum. It is possible that MCPS and the college could develop a cooperative program from which not only the students, but both institutions would derive benefit.

Training

There is no doubt whatsoever that bus aides who are already employed and those who will be employed in the future need to be given far more training than has been given in the past. Accepting this as a given, there are two issues involved: who should be responsible for training and what training should be given.

The Division of Transportation must be responsible for and in charge of the training of aides just as it is responsible for the training of drivers.[4] Or, in short, the managers of the division must have control over their own staff. Training should be the direct responsibility of the vehicle operator instructor (whose title should be changed) and the expanded training staff recommended in Chapters 9 and 15. Responsibility obviously does not mean that the Transportation Division itself must actually provide all of the training. The division should give aides training in operating special equipment like wheelchair lifts and in bus safety requirements and procedures.

Beyond that, aides should be given what amounts to paraprofessional training in dealing with the physically and emotionally handicapped. This could be provided by Montgomery College. However, it is probable that it could be given by the Office of Special and Alternative Education, with the help of the Department of Staff Development. If aides assigned to particular schools need additional special training, it can be given by the school staff. All training, however, should be coordinated by the vehicle operator instructor in the Division of Transportation.

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[4] In general, the Department of Staff Development tends to deal with in-service training of the professional staff while units (e.g., School Plant Operations, Transportation, etc.) have a training assistant to deal with the training of support services staff.

Transportation Division Control

The greatest problem faced by the administrators and supervisors of the Transportation Division is their lack of control over some operations (see Chapter 5). Anything that further reduces their control increases the division's operational problems and also increases the hidden costs to MCPS. Allowing any supplementary or alternative center to exercise even partial control over pupil transportation operations or staff takes control out of the hands of the division. However, the problem of the supplementary and alternative centers cannot be ignored. Therefore, issues must be sorted out very carefully.

Training is the first and most critical issue. The drivers of special education buses and the aides employed by the Transportation Division are not well trained. But this applies to all of them, not just to those who are assigned to buses serving a particular school. As has just been pointed out, all aides can be trained as paraprofessionals, and drivers can be given adequate supplementary training. There is nothing about this that suggests or implies that the Transportation Division should not be responsible for coordinating this training. In fact, one of the major problems in training aides and drivers is that at present the training is not coordinated by one responsible individual.

There are probably situations in which aides and drivers should have some continuous contact with the administrators, teachers, and pupils of a particular center or program. They might, for example, participate in staff meetings in which the progress of particular pupils is discussed or, perhaps, might work with pupils for a time. The present arrangement in which drivers work at Mark Twain for a day is therefore not in itself a bad idea. However, the kind of work they perform and the value of that work as training should be monitored and evaluated by the Transportation Division.

Another important issue is discipline. The first responsibility of bus drivers and aides is the safety of the bus and all of the passengers. Conduct rules on a moving bus are safety rules. They must be enforced just as they must be enforced in family cars and other vehicles in which many special and alternative education pupils go to school--without benefit of special education aides. Comparatively untrained drivers and almost totally untrained aides can no doubt cause problems among severely emotionally disturbed pupils (who may endanger their own safety and the safety of others), and those problems can carry over to the school. However, well coordinated training conducted by knowledgeable staff members should overcome much of this.

Finally, the idea that it is necessary and desirable for school administrators to be in control of any transportation staff or operations must be rejected in principle. If one school or center is allowed to have control, there is no reason why every other school should not demand the same right.

Special Cases

While the Transportation Division must be firmly in control of buses, drivers, aides, and conditions of transportation, it must be recognized that there are special cases that must be dealt with. The Mark Twain program, for example, is designed for pupils with difficult and complex emotional and behavioral problems. This is also true in one degree or another of other special and alternative programs. Therefore, there may be some cases in which even well-coordinated training might not, by itself, enable relatively inexperienced drivers and aides to meet the needs of some special-alternative pupils or programs.

In these cases, it might be necessary to recruit drivers and aides who have training and experience in special education transportation and assign them to the buses or runs serving these programs. Recruiting and retaining already well trained, experienced special education drivers and aides might be difficult. Well qualified people would undoubtedly expect and deserve higher salaries than are presently offered, especially if they were expected to take on extra responsibilities like attending staff meetings. But to pay one driver or aide a higher rate than another for being assigned to a particular bus or run (since all aides are assigned to special education buses) would be discriminatory. One solution to this problem would be to create promotional positions, making promotion dependent on training.

Recommendations

- The Board of Education should, with the assistance of an appropriate task force, set policies, regulations, and procedures for the following:
  - Criteria for determining the assignment of aides to buses
  - Determining the number, if any, of bus attendants to be employed
  - Responsibility for training of aides
  - Standards for the evaluation of aides that are tied to training
- In Chapter 9 it was recommended that a task force be formed to make recommendations for and to implement a recruiting campaign for drivers. Recruiting of aides should be included, particularly recruitment of Montgomery College students in the programs identified in this chapter.

- It was also recommended in Chapter 9 that the vehicle operator instructor position should be upgraded and that the instructor should be made responsible for coordinating all driver training. In addition, the following are recommended:

  - That the position be retitled to something like Instructor in Pupil Transportation

  - That the instructor be responsible for coordinating all instruction for both drivers and bus aides

  - That the Division of Transportation task force recommended in Chapter 9 include training for bus aides in its investigation and in making recommendations

- It was recommended in Chapter 9 that a task force and permanent committee under the chairmanship of the vehicle operator instructor (retitled) and made up of representatives of the Office of Special and Alternative Education and Department of Staff Development be formed to determine and arrange for driver training. It is recommended here that the task force include training for bus aides.

- Any arrangements that tend to give administrators of any special education or alternative center control of any aspect of school bus transportation should cease.

- Salary schedules for drivers and aides should be reviewed and the following should be considered by the Transportation Division:

  - Creation of special education promotional positions for drivers and aides, with promotion dependent upon experience and training in special and alternative education

  - General upgrading of aides' salaries, with experience and training being requirements for advancement to higher steps

CHAPTER 12

MANAGEMENT AND SUPERVISION

Introduction

As was said in Chapter 5, the managerial and supervisory staff of the Transportation Division respond to demands instead of planning and controlling some pupil transportation operations. The purpose here is to show how the organizational structure, inadequate staffing, and the deployment of the staff combine to create this situation.

While the research for this report was being done, the Transportation Division submitted a new staffing plan that was approved by the Board of Education in the FY 1983 budget. One new staff member will be added, and some positions in pupil transportation will be upgraded. However, as will be discussed towards the end of this chapter, the plan does not address most of the managerial and supervisory problems identified here.[1]

Organizational Structure and Staff

Exhibit 12.1 shows the FY 1982 organizational structure of pupil transportation, position titles, and (in parentheses) the number of staff members by position. Central office positions are above the horizontal line. Area office and depot positions are below the horizontal line and are clearly labeled.

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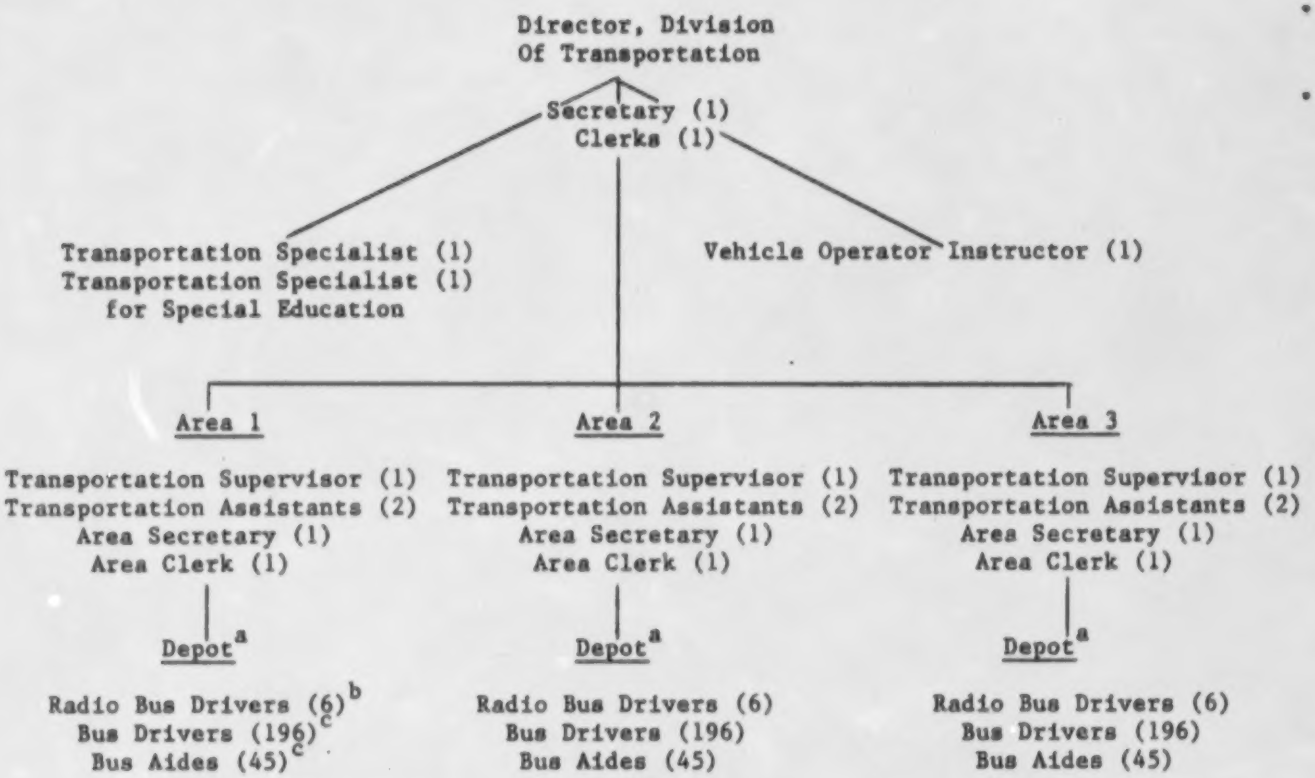
[1] With some minor exceptions which will be noted at appropriate times.

Exhibit 12.1

ORGANIZATIONAL STRUCTURE OF PUPIL TRANSPORTATION FY 1982


Director, Division Of Transportation
Secretary (1)
Clerks (1)
Transportation Specialist (1)
Transportation Specialist (1) for Special Education
Vehicle Operator Instructor (1)
Area 1
Transportation Supervisor (1)
Transportation Assistants (2)
Area Secretary (1)
Area Clerk (1)
Depot[a]
Radio Bus Drivers (6)[b]
Bus Drivers (196)[c]
Bus Aides (45)[c]
Area 2
Transportation Supervisor (1)
Transportation Assistants (2)
Area Secretary (1)
Area Clerk (1)
Depot[a]
Radio Bus Drivers (6)
Bus Drivers (196)
Bus Aides (45)
Area 3
Transportation Supervisor (1)
Transportation Assistants (2)
Area Secretary (1)
Area Clerk (1)
Depot[a]
Radio Bus Drivers (6)
Bus Drivers (196)
Bus Aides (45)

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[a] The diagram is somewhat misleading. There are 4 depots, not 3. Buses, drivers, and aides are assigned to areas, but stationed at depots. Drivers and aides from different areas are stationed at depots.

[b] Radio driver is not a position, but an assignment.

[c] Numbers of drivers and aides are averages for entire operation.

Central Office

Because most of the staff have been assigned to area offices, the central office is not staffed or organized to manage pupil transportation. It should be noted on Exhibit 12.1 that area transportation supervisors report to the director of the division and that there is no mid-level manager in the central office.[2] One of the transportation specialists is not a manager at all and has been responsible primarily for preparing the many reports required by MSDE. The other transportation specialist is responsible for the special education buses that serve some supplementary and alternative centers and for arranging private transportation of special education pupils. However, the greatest number of special education pupils ride regular buses managed by area office staff. The vehicle operator instructor has no regularly assigned staff and is therefore largely dependent on the area offices to provide the staff to conduct behind-the-wheel training (see Chapter 9). The vehicle operator instructor also depends on area offices to conduct continued certification training and on supplementary centers, which are completely independent of the Transportation Division, to conduct training in special education for drivers and aides (see Chapters 9 and 11).

It should be noticed in Exhibit 12.1 that the central office has no planning staff, which further weakens the ability of the central staff to manage pupil transportation. All planning of routes and schedules is done at area offices. Therefore, records of load counts (number of pupils riding buses), bus assignments, routes, etc. are scattered among the area offices where they are needed for use in daily operations. No one at the central office--or, indeed, at area offices--can get an overview of the entire pupil transportation operation or of the countywide bus route network. It is therefore impossible for the director, the only senior manager in the central office, to detect inefficiencies in operations or to plan adequately for the acquisition and distribution of resources. This means the central office staff are not able to exercise very much control over pupil transportation costs.

Area Offices

In each area office, the staff are entirely responsible for planning and managing all pupil transportation within the area. However, as can be seen in Exhibit 12.1, no area office is actually staffed or organized to plan, manage, supervise, and control operations. If clerical staff are included, only five individuals in an area office are responsible for an average of 16,000 pupils, 200 buses, 600 bus routes and schedules, and about 200 drivers and 45 bus attendents. As a result, staff members in an area office cannot perform many of the jobs for which they are made responsible.

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[2] In the FY 1983 budget, a mid-level position, supervisor of bus operations, has been created. This was done by reconstituting the position of one of the transportation specialists.

To compound problems, area transportation offices are located at school area administrative offices and are therefore widely separated from the division's central office and from one another (see Exhibit 2.2). This artificial separation, according to managers, makes communication and coordination of transportation far more difficult than when everyone worked at the same central office at Lincoln Center.[3] For example, special education buses have long routes which cross through more than one area. Area supervisors may have to confer among themselves and with the central office to determine how to make maximum use of one bus and to plan the best route. This takes many telephone calls among offices, with the usual delays, return calls, and postponement of decisions that result almost universally from interoffice calls. It also wastes time and increases the cost of communication.[4]

Finally, decentralization and area administration result in considerable inefficiency in any one area office and duplication of work among offices. There are so many buses, drivers, aides, etc. to be managed and so few staff members in any one office that there is no opportunity for specialization of work. The transportation supervisor cannot devote full time to planning and management. Transportation assistants cannot get out into the field to supervise, despite the fact that (according to the job description) they are supposed to act as field supervisors, dispatchers at depots, and behind-the-wheel driver trainers. Since the staff in each area office are responsible for all transportation operations, the same jobs are done in every office even though some of them could be done by one or two people for the entire transportation system.

Depots

Decentralization of the transportation depots was a sound idea. When all operations were either run from or carried out at the Lincoln Center, school buses, it is said, were scattered all over the county wherever a parking place could be found. Shops were crowded, and emergency vehicles were concentrated in the one area. Now there is parking on depot lots for most, but not all school buses, and buses are nearer to the schools they serve then they were at Lincoln Center. Shops are less crowded, and because most buses are parked adjacent to the shops, mechanics can get to them easily, even at night when drivers are not on duty. Emergency vehicles and stand-by buses are better deployed than before.

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[3] Artificial because area administration of transportation is merely an MCPS convention. There is nothing about pupil transportation that makes area administration necessary.

[4] Costs would be even greater and more time would be wasted if supervisors had to meet together to determine how to handle one bus route.

However, decentralization of depots, combined with the assignment of managers and supervisors to area offices, makes supervision and control even more difficult. Exhibit 12.1 is not entirely accurate because there are four depots, not three as shown in the exhibit. Depots are not under the direct control of area supervisors. Instead, buses, drivers, and aides are assigned to area offices but stationed at depots. At any given depot, buses, drivers, and aides assigned to different areas are mixed together. Drivers and aides do not report to the area offices to which they are assigned, but go directly to the depots when they begin and end their runs. Since there are no dispatchers at depots, there is no direct supervisory link between depots and area transportation offices. Therefore, area office staff have no direct control over buses, drivers, and aides.

As a matter of convenience, radio driver is referred to throughout this report as a position. It is not a position, however, but an assignment. Radio drivers are senior drivers whose buses are equipped with two-way radios. Like other drivers, they are assigned to area offices, but report to depots. They carry out some of the duties transportation assistants cannot perform: inform drivers of changes in schedules, carry messages, etc. However, they are not supervisors and cannot be counted as part of the managerial-supervisory staff.[5]

External Management: An Informal System

The organizational structure should reflect not only managerial and supervisory control but also decision-making authority. Thus in Exhibit 12.1, it would seem as if most decisions about bus service are made by either the transportation supervisors or the director of the division. What is not shown in Exhibit 12.1, however, is that there are "external managers" of pupil transportation.

The reason the MORE team was given for the assignment of pupil transportation offices to school area administrative offices was that it was believed that transportation supervisors should be physically close to area associate superintendents. Thus, both in concept and actuality, area administration imposes a layer of management between the Transportation Division's central office and the area transportation offices. Transportation supervisors reported that area superintendents, sometimes for their own reasons and sometimes acting for principals, make demands for services that are actually predetermined managerial decisions. That is, the supervisors said that when an area associate superintendent makes a request or a demand, they know that the request will eventually be granted by some higher authority. It should be mentioned that as far as the MORE team could determine, there are good working relationships between transportation supervisors and area associate superintendents. However, this does not alter the fact that quite often associate superintendents are managers of pupil transportation.

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[5] In the FY 1983 budget, 12 route supervisor positions were created, four in each administrative area. Each supervisor will be responsible for a given number of drivers. (See discussion later in this chapter.)

Pupil transportation has other "external managers" as well: principals, program directors, and even the families of the pupils who ride the buses. The pupil transportation staff reported that decisions about service are made at the demand of all of them. A simple example might be a case in which a parent claims that a child lives within the transportation boundary and is therefore eligible for bus transportation. It is said the sequence of events will be something like this:

- Area transportation assistant measures the home-school distance and reports the pupil is not eligible for transportation. Parent appeals the decision.

- Area transportation supervisor is ordered to measure again; reports pupil is not eligible for transportation. Parent appeals.

- Director of the Transportation Division is ordered to measure yet again; reports that pupil is not eligible. Parent appeals.

- Director of School Services is ordered to take the measurement; reports pupil is not eligible.

At this juncture, if the parent is persistent, the Transportation Division may well be ordered to transport not only the child in question but perhaps other pupils who live on the same street as well.

Exercises of this kind, frequently repeated, convince administrators and supervisors of the division that while they have responsibility, they have little real authority or control.[6] They are apparently largely correct. Even if the child in the fictitious example were finally declared ineligible for transportation, each staff member would, in effect, have been told that he cannot make and enforce what should be a simple decision. In addition, the whole process would have wasted staff time and money.

Evidence Of Understaffing

Manager:Worker Ratio

The manager-to-worker ratio is a rough measure of the number of workers each manager and supervisor is expected to control. (A ratio of 15:45 would mean that each manager is responsible for 3 workers on the average.) It is a bit difficult to obtain such a ratio for pupil transportation, because not everyone in a higher-level position actually manages or supervises operations.

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[6] The fictitous example is quite similar to an actual situation observed by the MORE staff.

Since the three area supervisors report directly to the director of the division, it might be considered that there are only four managers for the entire pupil transportation staff, a ratio of approximately 1:192 (4:767). On the other hand, the two transportation specialists and the six transportation assistants might be considered managers and supervisors. In that case, the ratio would be 1:63 (12:759). At either extreme, 1:192 or 1:63, very few managers and supervisors are responsible for a large number of secretaries, clerks, drivers, and aides.

Comparison with Ride-On

It is interesting to compare the managerial-supervisory staffing of the Transportation Division with that of the Montgomery County public Ride-On system as is done in Exhibit 12.2. In this comparison, every Transportation Division staff member who, by any stretch of the imagination, could be counted as a manager or supervisor was included. In contrast, only half of the time of the Ride-On management staff (but all of the time of the operations staff) was counted because it was reported that managers devote part of their time to coordinating Metro in the county. Thus the comparison is extremely conservative. It should be noted that positions cannot be matched exactly, but that the distinction between management and operations conforms to practices in Ride-On.

Ride-On has the FTE of seven members on what might be considered the central office staff; MCPS has four. Both Ride-On and MCPS have 21 operations staff members, but those in the MCPS area offices are responsible not only for operations but also for all planning, and scheduling.

The most striking comparison is between the number of managers and supervisors and the number of buses and workers to be supervised. Ride-On employs 28 managers and supervisors (including planners, etc.), while MCPS employs only 31. However, Ride-On employs only 184 drivers, some of whom work part time, and has only 90 buses on the road at peak times. MCPS employs 508 FTE drivers and aides and has 624 buses on the road at least twice a day. Managerial and supervisory ratios in the two systems are therefore as follows:

	Ride-On	MCPS
Managers to drivers and aides	28:184	31:508
Managers to buses	28:90	31:624
Ratio, managers to drivers and aides	1:6.6	1:16.4
Ratio, managers to buses	1:3.2	1:20.1

Each MCPS Transportation Division manager is expected to control 2.5 times as many drivers and aides as each Ride-On manager controls and 6.3 times as many buses. Furthermore, MCPS bus routes and schedules are far more complex than those of the Ride-On system, particularly the routes and schedules of the almost 200 special education buses that constitute a fleet which, by itself, is more than double the size of the Ride-On fleet at its peak.

The situation becomes unbelievable when Ride-On staffing is compared with staffing in the Transportation Division's area offices. As was said earlier, in any one area office, three manager-supervisors are responsible for an average of 200 buses, 200 drivers, and 45 aides (245 workers total). That is more than double the number of buses and 1.33 times the number of workers for which 25 Ride-On managers are responsible.

In fairness, it should be pointed out that only 6 of the 13 Ride-On controllers are on duty at any one time. However, Ride-On controllers are on duty for only a normal working day and relieved by their replacement. In contrast, MCPS supervisors must often work 10 to 12 hours a day (an FTE of as much as 1.5) to handle daily operations alone, to say nothing of planning and long-range management. Furthermore, it can probably be safely assumed that the 14 central office staff members of Ride-On could, when necessary, devote 100 percent of their time to the system, increasing the FTE staff to 35, compared to the Transportation Division's 25. In any case, the disparity in the number of workers and buses to be managed and supervised is so great that none of this makes any real difference.

Area Staff Work Load And Patterns of Work

As has been mentioned several times, the MORE team conducted a time-task survey at all three area transportation offices to determine what jobs are done (and not done) and what the typical work patterns are. The methodology employed is described in Appendix A, though it might be mentioned here that the technique is one that is commonly used in personnel studies.[7]

Transportation assistants, secretaries, and clerks were included in the study, but not transportation supervisors. The week selected was not one in which the support services payroll is usually prepared, a fact which has bearing on secretarial and clerical time.

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[7] In a selected week, through every hour of every work day, a record was made at the end of each 10 minutes of the task the individual was performing at the time. It need not be assumed that the individual worked on the recorded task for 10 continuous minutes.

Exhibit 12.2

A COMPARISON OF MANAGERIAL AND SUPERVISORY STAFF OF MCPS TRANSPORTATION DIVISION AND MONTGOMERY COUNTY "RIDE-ON"

Ride-On		MCPS: FY 1982	
Position	N	Position	N
Division Chief[a]	.5	Division Chief	1
Assistant Division Chief	.5	Transportation specialist	2
		Vehicle operator instructor	1
MANAGEMENT[a]			
Section Chief	.5		
Routes and Schedules Unit			
Senior planner	.5		
Planner	.5		
Transit analyst	1.5		
Transit aide	2.0		
Program Analysis Unit[b]			
Senior planner	.5		
Program assistant	.5		
OPERATIONS[c]			
Operations Chief	1.0	Area transportation supervisor	3
Assistant Operations Chief	1.0	Area transportation assistant	6
Unit supervisor	1.0	Radio driver	18
Operations supervisor	5.0		
Controller	13.0		
TOTAL	28	TOTAL	31
NUMBER OF DRIVERS	184[d]	NUMBER OF DRIVER FTE's	406
		NUMBER OF AIDE FTE's	102
		TOTAL	508
NUMBER OF BUSES AT PEAK	90	NUMBER OF BUSES ON ROUTES	624

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[a] 50 percent of time devoted to Ride-On, 50 percent to Metro; only Ride-On time counted here.

[b] Program analysis unit carries out financial analyses.

[c] 100 percent of time of operations unit devoted to Ride-On in Silver Spring and Gaithersburg

[d] Includes 38 part-time drivers.

Time by Task and Position

Exhibit 12.3 shows the percentage of time devoted to certain jobs by task and staff position, approximately in descending percentages of time. Talking on the telephone accounted for the largest percentage of time of all staff members. Depending on the area and the individual, transportation assistants spent between 29 percent and 97 percent of their time talking on the phone, with an average (median) of 67.5 percent. Secretaries and clerks spent an average (median) of 49 percent of their time on the telephone, but the frequency of recording was inflated by their answering calls and then turning them over to transportation assistants.

Next in order of percentage--but not approaching time on the phone--was the average of 18.5 percent the clerical staff spent on typing and the 18.5 percent on the payroll. Neither is reasonable; the first is too little and the second too much. Transportation supervisors reported that there is always a backlog of typing, especially of load counts, route descriptions, and revisions of both. In contrast, the clerical staff should not have to spend 18.5 percent of their time on payroll *in a non-payroll week*. That they do is a reflection of the fact that the pupil transportation payroll is extremely complex, as was pointed out in Chapter 10.

The 12.5 percent of the time transportation assistants devoted to managing routes and schedules cannot be considered plannning time. Instead, the time was spent on modifying existing routes and schedules to take care of daily changes in demand. Because of an error in the way records were made, time devoted to field trips seems very modest. However, participants in the study were always busy and could not take time to make precise distinctions in types of telephone calls they dealt with. Therefore, some field trip time was counted as time on the telephone. In the long run, this makes very little difference and does not change the generality about time spent on the phone.

Perhaps the most important observation that can be made is that during the week of the study, transportation assistants did *none* of the on-the-road jobs for which they are responsible according to the job description. They did not go out into the field at all and therefore could not field check routes, measure road distances, evaluate safety conditions, or observe or supervise drivers.[8] It is also important to note that secretaries and clerks were able to devote only about 18 percent of their time to revising and updating the information the transportation supervisors need for daily operations and route planning.

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[8] See Department of Personnel Services job description. These are only some of the field supervision jobs for which transportation assistants are responsible.

Exhibit 12.3

PERCENTAGE OF TIME DEVOTED TO[a] TASKS BY TASK AND POSITION

Task	Range of Percentage	Median Percentage
Telephone, all staff members	22-97	44.5
Transportation Assistants	22-97	67.5
Secretaries	22-40	28.0
Clerks	23-50	49.0
Typing, secretaries and clerks only	8-44	18.5
Payroll, secretaries and clerks only	9-46	18.5
Routes and schedules, transportation[b] assistants only	2-48	12.5
Radio, transportation assistants only[c]	1-15	11.5
Field trips, transportation assistants only[d]	6-56	8.0
Other Tasks[e]		
Transportation Assistants	1-7	3.5
Secretaries and Clerks	8-31	22.5

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[a] Percentage of time on the job, but excluding leave; therefore not a percentage of the standard 40-hour work week. Percentages are not additive.

[b] Primarily revising bus routes and managing schedule changes.

[c] Time spent receiving and sending radio messages from radio drivers, depots, and other area offices.

[d] There is probably some recording error here. Some of the time devoted to field trips is undoubtedly included under the category telephone because so much planning of field trips is done by phone.

[e] A variety of not easily described tasks like operating duplicating machines, ordering office supplies, etc.

Time on Task

Transportation supervisors reported that it is difficult and sometimes impossible for them and other area staff to devote time to jobs that, by their nature, require continuous concentrated attention. Perhaps the best example of such a job is planning routes and schedules. This is a complex task which should involve examination of the route network; measurement of distances on maps (and on the road); and trying out on maps various permutations of stops, routes, and time. It is not a job that can be done in bits and pieces, especially when, in any given area, there are about 200 buses, 600 runs, and many complex schedules. Preparation of the extremely complicated payroll, with all of the confusing combinations of trip tickets, time, runs, and accounts is yet another example. It is probably safe to say that the possibility of error increases with every interruption.

The MORE staff analyzed the time-task data to determine if the situation in the area office is actually as described by the supervisors. It turned out that the data supported their contentions. Exhibit 12.4 shows how continuously staff members were able to work on one task. While an example of the meaning of the data is given at the bottom of the exhibit, it is again the pattern of work that is important here.

Of all of the non-telephone tasks done by transportation assistants, 70 percent were performed continuously for only one record period, a maximum of 10 minutes. The same thing is true of 33 percent of all of the non-phone jobs done by scretaries and 34 percent of all non-phone jobs done by clerks. In contrast, substantial percentages of the telephone tasks were performed for longer continuous periods.

As the number of continuous recording periods increases, smaller and smaller percentages of jobs are accounted for. For example, 85 percent of all non-phone jobs done by transportation assistants were performed continuously for a maximum of 20 minutes or less and 92 percent for a maximum of 30 minutes or less.

It could be argued, of course, that the typical job done in an area office should take only a comparatively short continuous period of work. While acknowledging that this is probable, it is nonetheless obvious that the pattern shown in Exhibit 12.4 confirms the frequently reported complaint of pupil transportation managers and staff that they are often unable to carry out their responsibilities effectively because they are too frequently interrupted.[9]

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[9] Admittedly a difficult concept. A clerk who is responsible for both typing and answering the telephone cannot be said to be interrupted when taking a call. However, if answering the phone takes so much time that no typing gets done, it is an interruption at least some of the time. That is the situation in area transportation offices.

Exhibit 12.4

PERCENTAGE OF TASKS BY CONTINUOUS TIME PERIOD

Recording[a] Periods	Transp. Assistants Phone	Transp. Assistants Not Phone	Transp. Assistants Total	Secretaries Phone	Secretaries Not Phone	Secretaries Total	Clerks Phone	Clerks Not Phone	Clerks Total
1	39	70	57	53	33	40	35	34	34
2	19	15	17	28	33	31	30	36	33
3	17	7	11	11	14	13	12	13	13
4	7	3	5	5	6	6	11	3	7
5	2	2	2	1	9	6	4	4	4
6	2	1	1	1	2	2	4	7	6
7	2	1	2		1	3	2		1
8	3	.3	2						
9	2		1		2	2			
10	1		1				1	2	2
11-20		.3	.2		1	1	1	1	1
21-30	1	.3	1					1	.3
31-40									
41-48	2								

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[a] A record of the task being performed was made at the end of each 10-minute time period every hour of every day during the work week. A "recording period" is therefore a 10-minute period. A "continuous time period" is one or more successive recording periods in which the same task was recorded. The following example shows how to read the table:

Of all of the Not Phone jobs done by transportation assistants during the study, 70 percent were done continuously for only one 10-minute period, 15 percent were done continuously for as long as two 10-minute periods, and 7 percent were done continuously for as long as three 10-minute periods. Only about 8 percent (the remaining 3 + 2 + 1, etc.) were done for 40 minutes or longer.

Exhibit 12.5

IMPORTANT SUPERVISORY JOBS NOT BEING PERFORMED AT PRESENT OR INADEQUATELY PERFORMED

- Behind-the-wheel observation and evaluation of drivers (MSDE requires that this be done every two years.)
- On-the-bus observation and evaluation of bus aides
- On-the-road observation or spot checks (including covert spot checks) of drivers for the following:
    - Safe driving practices
    - Adherence to routes
    - Adherence to schedules
    - Unauthorized personal use of buses
- Daily or other frequent periodic check of bus odometers for the following reasons:
    - To control personal use of buses
    - To check length of routes and adherence to routes
    - To provide baseline data for fuel consumption and planning data for routes
- Daily observation of drivers' performance of pre-trip safety inspection of buses
- Checking buses off and on depot lots to control time and personal use
- Providing information to drivers about their performance

Supervision And Control

In view of what has been said thus far, it is not surprising that there is little or no supervision of drivers and aides or control over buses or the number of miles driven. The situation is illustrated by a recent incident that was reported by two supervising automotive mechanics. It was said that it was discovered that a bus was missing from one of the depot lots. It seems that a driver wanted to use a bus for a personal trip but did not want to use the one assigned to her. She simply took another bus, used it, and returned it to a different lot than the one from which she had taken it.[10] The bus could not be found for a week, which adds to the story the fact that the presence of an extra bus on a lot went unnoticed for all that time.

Exhibit 12.5 identifies some of the supervisory jobs that, according to managers, supervisors, and drivers, are not being performed at all or are inadequately performed. While there are others which also are not done, those included here are the ones that would give some measure of control over buses, bus mileage, and the performance of drivers and aides.

Behind-Wheel and On-Road Observation

MSDE requires that a trained supervisor will observe and evaluate the performance of each driver every other year. Observations and evaluation of bus aides is required by MCPS (as for all other employees). These observations are not being done or are done infrequently and erratically. Evaluations are done, but evaluations are obviously not based on observations of job performance. Supervisors complain that they do not believe they can fairly evaluate drivers and aides whom they cannot observe and may know as a name on a roster.

While not required, on-the-road observations, or spot checks, may be far more important than the formal observations required by MSDE. Transportation managers say that covert supervision makes drivers more cautious because they have reason to believe that a supervisor might be lurking around the next bend in the road. This, they say, improves driving safety and leads to a decrease in the number of bus accidents.[11] It is also a way to check on drivers' adherence to routes and schedules and a way to reduce the unauthorized use of buses, which is a problem in pupil transportation.

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[10] Aided, it was reported, by the fact that the keys of buses of like manufacture are interchangeable.

[11] Supporting data are presented in a memorandum from the director of the Transportation Division to the director of the Department of School Services, August 1981.

Odometer Check

Control over bus mileage is the most critical control over pupil transportation costs because the more miles a bus travels, the more fuel and maintenance it requires; driving time also increases, as do drivers' salaries (see Chapter 13 for discussion). Determining route mileage, total mileage, and fuel consumption is also important for planning routes, schedules, and bus assignments.

The Transportation Division collects mileage data. The fuel delivery system is computerized, and drivers are required to enter odometer readings when they get gas. Managers reported that three times a year each driver fills out a route mileage report, which is turned in to the area transportation office. In addition, a record of mileage as measured by the bus odometer is made at the beginning and end of the year. Finally, in May of 1982, on the orders of the associate superintendent for Supportive Services, drivers made reports of mileage and fuel consumption for the month.

The mileage data obtained in these various ways are generally meaningless. Managers and supervisors do not know what proportion of the mileage is accounted for by inefficiencies in routes or by such things as trips to the grocery store. Therefore, there are no reliable baseline data on which to make planning decisions.

Pre-Trip Inspection

Every driver is supposed to make a pre-trip safety inspection of the bus before leaving the depot lot. At present, this is left entirely to the driver, and no supervisor is present to see that drivers actually perform the inspection. There is no evidence that an MCPS school bus has been involved in an accident because a driver failed to detect a mechanical problem before taking a bus from the lot. However, vandalism is a problem on some lots, and hazardous damage like cutting break lines can be done. Properly monitored pre-trip inspection is therefore obviously essential to guarantee that an accident will not happen because mechanical failure has gone undetected. In any event, drivers are paid daily for the time they are supposed to spend on inspections, and they should be required to do the job.

Checking Buses Out and In

The case of the missing bus is all the evidence needed to show why buses should be checked when they leave and again when they return to the lot. In addition, both drivers and automotive supervisors reported that some drivers who are not authorized to park their buses at home do so anyway. This and all other unauthorized use of buses must be controlled, and one of the only controls is to check buses out and in at the depot lots (plus odometer checks).

Drivers' Reports on Supervision

The percentages of drivers who responded in given ways to questions about supervision are shown in Exhibit 12.6. When analyzing the responses, the MORE team got the strong impression that drivers often responded in ways that would support their supervisors, even though answers might not be entirely accurate.[12] Even taking this into account, 51 percent of the drivers reported that a supervisor or transportation assistant never rides the bus as an observer. Twenty-two percent said they were not aware the supervisor does this, a response that must be counted as a no. Thus, 73 percent reported that supervisors do not make on-bus observations.

In view of the fact that supervisors do not make on-the-road checks, it is surprising that 50 percent of the drivers said they are observed on the road. Perhaps those drivers do believe that a supervisor may be lurking around the next bend in the road. However, this leaves 50 percent who said they are not observed on the road or that they are not aware the supervisor does this (and they are right).

Information About Job Performance

Because there is little supervision, drivers do not generally get information about their job performance, or, more accurately, they are not likely to get information unless someone compliments or complains about some individual. It is as if drivers are considered satisfactory unless something unpleasant is reported.

The vast majority of drivers (Exhibit 12.6) said they do not get information about their job performance (54 percent) or that they get information only rarely (19 percent). Only 3 percent said they get information often, and 10 percent said they get it sometimes. According to 69 percent, drivers are informed when someone calls the area office with a compliment or, more likely, a complaint.

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[12] A somewhat frustrating (for the MORE staff) but not entirely objectionable way of answering questions. The impression given was that drivers are quite loyal to their supervisors and passengers, and even to their buses. If this is true, both supervisors and drivers are to be commended.

Exhibit 12.6

PERCENTAGES OF DRIVERS RESPONDING IN GIVEN WAYS TO QUESTIONS ABOUT SUPERVISION

Question	Response[a]	Percentage Of Drivers[b]
How often during one school year does your supervisor (or assistant ride on your bus as an observer during a regular run?	Never	51
	Not aware supervisor does this	22
		73
How often does your supervisor check you out on the road (but not riding with you) when you are making a run to see if you are driving safely, on schedule, etc.?	Never	11
	Not aware supervisor does this	39
		50
Do you get feedback or information about your performance as a result of observation of your driving?	Yes, often	3
	Yes, sometimes	10
	Yes, but rarely	19
	No	54
		86
As far as you can tell, are you usually informed when a principal, teacher, parent, or member of the public calls Transportation to compliment you or complain about you?	Yes	69
	No way for me to tell	25
		94
About how often do you get to talk with your supervisor (assistant) about your job performance or job related problems?	Once a week-once in 2 weeks	22
	1-2 times a month	7
	1-2 times in 2 months	8
	Less than once in 2 months	16
	Never or almost never	31
		64

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[a] All pre-coded responses are not reported for every item.

[b] Because all responses not reported and because there was a small percentage of no responses, totals will not equal 100 percent.

The majority of drivers apparently rarely have personal contact with a supervisor. Nearly half (47 percent) said they never talk with a supervisor about the job or that they do so less than once in two months. Another 8 percent said they do so perhaps once or twice in two months. Since transportation supervisors themselves say they and their assistants cannot get into the field very often, it is possible that the 22 percent of the drivers who say they talk with a supervisor at least once in two weeks included radio drivers or even supervising automotive mechanics as supervisors. However, in comments written on questionnaires, many drivers said they feel free to talk with a supervisor whenever they need to, though this is not at all the same as a supervisor-initiated discussion of the individual's job performance.

The Transportation Division's Reorganization Plan

All of the staff members of the Transportation Division are well aware of the many problems they face. Therefore, in an attempt to mitigate the situation, the director of the division drew up and submitted a staffing proposal referred to in memoranda as a "reorganization plan." The plan was approved by the director of School Services and the associate superintendent for Supportive Services. It was then reviewed by the Board of Education and tentatively approved and funded for the latter half of FY 1983.

Brief Review of Plan

Exhibit 12.7 illustrates the staffing and organizational structure of pupil transportation that would result from the full adoption of the division's plan. Central office positions are at the top of the exhibit. Area and depot positions are clearly labeled, but it should be remembered that there are four depots, not three. The number of staff members by position (including totals for all four depots) are shown in parentheses. It can be seen in the diagram that the division's plan in its entirety consists only of the following:

- One already existing central office position is reconstituted to supervisor of bus operations.

- One new position is added to the central staff: assistant in special and alternative education transportation.

- One already existing position in each area office is reconstituted to assistant transportation supervisor.

- Twelve bus route supervisor positions have been created, but this represents reconstitution of the radio driver positions, not the addition of staff members. Each route supervisor will be responsible for a given number of drivers.

Exhibit 12.7

THE TRANSPORTATION DIVISION'S REORGANIZATION PLAN: FY 1983

Division Director

Supervisor of Bus Operations (1)[a]

(1) Transportation Specialist:
Special-Alternative Education

(1) Transportation Assistant in
Special-Alternative Education[b]

Vehicle Operator Instructor (1)

Area 1	Area 2	Area 3
Transportation Supervisor (1)	Transportation Supervisor (1)	Transportation Supervisor (1)
Assistant Supervisor (1)[a]	Assistant Supervisor[a] (1)	Assistant Supervisor (1)[a]
Transportation Assistant (1)	Transportation Assistant (1)	Transportation Assistant (1)
Area Secretary (1)	Area Secretary (1)	Area Secretary (1)
Area Clerk (1)	Area Clerk (1)	Area Clerk (1)
Depot[c]	Depot[c]	Depot[c]
Bus Route Supervisor (4)[a]	Bus Route Supervisor (4)[a]	Bus Route Supervisor (4)[a]
Bus Drivers (196)[d]	Bus Drivers (196)[d]	Bus Drivers (196)[d]
Bus Aides (45)[d]	Bus Aides (45)[d]	Bus Aides (45)[d]

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[a] Not an addition to the staff, but position upgraded from existing position or, as with radio drivers (route supervisors), assignment.

[b] New position and addition to staff; applies to only one position.

[c] There are four depots, not three; staff are shown by area assignment.

[d] Average per area using FY 1982 figures to produce comparability with Exhibit 12.1.

Potential Benefits and Problems

It is possible that some benefits would be realized if this plan were implemented. A mid-level manager between the director of the division and area transportation supervisors is needed, as it has been put by the staff, to keep the director from being "nickled and dimed to death" by minor problems. Any increase in staff represents an improvement, so the addition of the special-alternative transportation assistant (the one increase) cannot help but be beneficial. Assistant transportation supervisors have been needed in the area offices for some time to take charge when a transportation supervisor is on leave. Route supervisors are also badly needed, because radio drivers have no supervisory authority.

The supervisor of bus operations is a central office staff member. As was shown earlier, the central office is not staffed or organized to manage the transportation system, and no one has the information on which to base an overview of the entire operation. No provisions are made in the plan for changing the situation or obtaining information. Therefore, the supervisor of bus operations will be in the same position central office staff have been in since decentralization: unable to see the entire system, unable to identify inefficiencies, and unable to plan for the acquisition and distribution of resources.

The special-alternative assistant will probably not actually be able to perform all of the tasks envisioned in the plan (see the FY 1983 budget). As is discussed at length in Chapter 7, the assistant will not be able to represent the division adequately at CARD and similar meetings if only because there are so many of them and because many are held simultaneously. However, it is possible that the assistant could be influential in meetings in which the location of programs is determined, and that may be the individual's important contribution.

Since there would be no increase in staff at the area offices, it is difficult to see any real improvement in working conditions or in the staff's ability to control operations as a result of the appointment of an assistant transportation supervisor. Though the position is undoubtedly needed, the major gain would seem to be the one already mentioned: someone to take charge when the transportation supervisor is on leave or away from the office.

According to the plan, the new route supervisors will not only take on the responsibilities of radio drivers and will also have additional supervisory responsibilities. It is doubtful that they can meet all of these demands. For example, a bus route supervisor is to supervise and coordinate daily bus operations (source is FY 1983 budget). But coordination is carried out at and among area offices. Route supervisors will be at depots, not at area offices, but at times, they will be on the road and will not be at either an office or a depot. Present radio drivers go to the scene of an accident or breakdown and, if necessary, transport to school the pupils from the disabled bus. Unless route supervisors are relieved of this responsibility, it will interfere with their supervisory duties. But if they are relieved, there will be no other staff members to assume the responsibility. Finally, route supervisors are to supervise and evaluate drivers and aides, including on-the-road and on-bus evaluation, but they are also to serve as substitute drivers. Substitutes (see Chapter 10) are needed daily and they are needed at the times regular drivers and aides are on the road doing home-school-home runs. A route supervisor who drives as a substitute cannot also perform the required supervisory jobs. In the final analysis, field supervision might be slightly improved by the appointment of route supervisors, but in many circumstances, route supervisors will probably turn out to be nothing more than better paid radio drivers.

Inadequacies of the Plan

By comparing Exhibit 12.7 to Exhibit 12.1, it can be seen that with the possible exceptions just noted, the division's plan firmly maintains the status quo in the following ways:

- The central office continues to be minimally staffed and unequipped to manage and control pupil transportation and transportation costs.
- Transportation continues to be linked to school administrative areas with an external layer of management between the division's central office and the transportation supervisors.
- Area office staff continue to be responsible for all planning, management, supervision, and control of pupil transportation, including for the bulk of special education transportation.
- If the 4 route supervisors are counted, in each area office only 7 manager-supervisors would be responsible for 200 buses and drivers, 45 aides, 600 routes, and 16,000 pupils. Compared to Ride-On, with its 25 managers for 90 buses, the number of manager-supervisors per area continues to be almost ludicrous.
- No provisions are made for a dispatcher or other constant supervision at depots. Route supervisors, buses, drivers, and aides continue to report to depots and are mixed by area assignment at depots.
- Route supervisors, because their duties take them away from depots, will provide only a tenuous link between depots and area offices.

These are the conditions that give rise to most of the problems that have been discussed previously in this chapter. Therefore, in perpetuating the status quo, the division's plan also perpetuates the causes of many pupil transportation problems, including the possibility of increasing costs.

Discussion

Decentralization and Area Administraton

Instead of facilitating management, supervision, and control of operations and costs, the organizational structure of pupil transportation and the deployment of staff provide impediments. The central office is not organized to manage the overall operation. Managers and supervisors are separated from one another and from the central office, even though, together, they are supposed to control a system which requires coordinating more than 600 buses and 1,800 routes and schedules. Supervisors are separated from the buses and workers they are supposed to supervise, and there is no constant managerial connection between depots and area offices.

Staffing

All of the data and all of the other findings of this study show that pupil transportation is badly understaffed. Area administration of transportation breaks an already too small staff into even smaller units, but makes each small unit responsible for a very large number of buses, routes, and workers. Because each unit is responsible for all tasks, staff cannot divide the work (i.e., specialize) and everyone must do whatever job needs to be done at the moment. This is highly inefficient. Effiency is further reduced by the endless duplication of tasks and work in the three offices.

Increasing Responsibilities

When a staff is too small and the number of jobs increases, there is a point at which not all of the jobs can be done. That point was probably reached in pupil transportation as long as five or six years ago. But since then, the numbers of services, buses, drivers, and aides, and therefore the number of tasks, have continued to grow. It is small wonder, then, that so many tasks cannot be done by the pupil transportation staff, including those that might reduce transportation costs.

Supervision and Control

No real supervision or control is exercised in pupil transportation. As was shown in this chapter, even the supervision required by MSDE and the minimal observations and evaluations required by the MCPS evaluation procedure are not done. There is every reason to believe that lack of supervision and control results in increased costs.

Decision Making

It is not unusual in any organization for upper echelon administrators to countermand decisions of managers and supervisors and thus, in a particular case, limit their authority. In pupil transportation, however, this happens far too often, partly because of area administration and partly because there is almost no limit to the number of appeals to higher and higher authority that can be made by users of transportation services. Yet there must be limits, partly because managers of pupil transportation must have a a greater amount of control over operations than they now have. In addition, unless there are limits, MCPS will continue to pay high salaries to supervisors, the division director, the department director, and even to those in higher positions to perform jobs that could be done by a transportation assistant in a matter of minutes without ever leaving the area office (e.g., measuring walk-ride boundaries on a map.).

The Division's Reorganization Plan

The division's plan is not a plan for the reorganization of pupil transportation. It will mitigate, not solve, some of the division's problems. However, the plan does not go far enough and does not address most of the problems caused by the organization of pupil transportation, understaffing, and the deployment of staff.

Recommendations

A discussion of the most important recommendations that stem from the findings presented here is postponed until Chapter 15, in which the MORE team offers a plan for staffing and reorganization of pupil transportation. The following recommendation is the only one that will not be presented there:

- The Board of Education should adopt policies, regulations, and procedures that will give decision-making authority primarily to managers of the Transportation Division, except in major or unusual cases to be defined by the Board of Education. The Board should also adopt policies, regulations, and procedures that will limit the kind and number of appeals that can be made about pupil transportation services.

CHAPTER 13

PLANNING AND INFORMATION FOR PLANNING: THE PRESENT STATUS

Introduction

The Transportation Division is expected to carry out three interrelated kinds of planning, all of which have an impact on pupil transportation costs: operational planning, resource planning, and long-range methodological and technological planning. Operational planning is of primary importance. Regardless of the adequacy of resources, the staff must plan routes and schedules for the forthcoming school year and modify them during the course of the year to meet changing conditions of operation. They must also plan the resources (buses, drivers, etc.) required to meet the transportation needs of the forthcoming school year. Ideally, this budget planning should stem from operational planning. Finally, at longer range, they are expected to keep abreast of changes in methodology and technology and to make plans for adopting new techniques when they promise to increase the efficiency of operations and reduce costs.

The purpose of this chapter is to show how operational planning, the foundation of budget planning, is currently carried out. There is also a discussion of the inadequacy of the information available to the pupil transportation staff. Some of the long range-proposals for reducing costs that are currently under consideration are discussed in the next chapter.

How Planning Is Currently Carried Out

The Roots in The Past

At present, the division's planning is not done by a method or a system. Rather, it is a way of doing things that is firmly rooted in the past. It does not take into account present realities that make it essential to reduce costs. The following are part of the inheritance that continue to influence thinking not only in the Division of Transportation but also throughout MCPS:

- Before FY 1982, MSDE financed most of the transportation budget, including the purchase of new buses.

- The amount of money granted by MSDE was based primarily on the number of pupils transported, the number of bus routes, and bus mileage. The more buses and the more mileage, the more income was derived from MSDE.

- There has been little incentive for MCPS to reduce costs through efficient planning. Problems could be solved at little cost to MCPS by adding buses--and therefore miles--instead of by reviewing and modifying the bus route network.

- There has been little need for information for plannning. Data have been collected and stored in the central computer and reports have been produced primarily to satisfy MSDE's reporting requirements.

In addition, the present managers of pupil transportation, many of whom are comparatively new in their positions or assignments, inherited the following:

- An extensive and complex bus route network

- Traditional opening and closing times of schools

- A system in which bus assignments and routes are based primarily on load counts (see following section), not on information about pupils.

A single example should suffice here to show that the past continues to exercise a strong influence on the present. The following is an excerpt from a previously quoted memorandum written by the director of the Transportation Division to support a budget request for FY 1983:[1]

> [In] FY83, 21 schools will be closed. It is estimated that 20 additional buses and 20 additional drivers [FTE of 10] will be needed to transport the pupils. These estimates were based on figures supplied by [the Associate Superintendent for Instruction and Program Development].

Several things are apparent here. First, it should be noted that the solution to the problem of transporting additional pupils is to add buses and drivers.[2] Data to justify adding buses were not obtained from a review of the entire bus route network, because the division does not have the ability to make such a review. Rather, the figures on which the estimate is based had to be obtained somewhat secondhand from the Office of Instruction and Program Development.

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[1] Director, Division of Transportation, October 15, 1981

[2] Adding buses may be the correct solution, but the number of pupils alone is not proof. Local decreases in enrollment, creating new bus stops, and rerouting buses might reduce the number of buses and drivers needed, if, indeed, any additions are actually required. The point here is that proof was not offered.

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Load Counts, Bus Assignments, and Routes

Since data have been collected primarily to satisfy MSDE's requirements and not for the benefit of the Transportation Division, the pupil transportation staff does not get information about pupils (see also later discussions). Therefore, the staff have to make do with the information they are able to collect on their own.

Periodically during the school year, each driver is required to count and report to the area transportation office the number of children who get on the bus at each stop. These load counts for single buses can be totaled by route, run, school, area, and system. Over the years, the Transportation Division has accumulated a historical record of load counts, which the pupil transportation staff use to make projections of the number of buses to be assigned to schools and routes.

Area transportation supervisors attempt to collect other information that may affect the number of buses assigned to given routes and the location of bus stops. For example, they try to keep abreast of new housing development, road construction, and similar changes. This tends to be done independently in each area, and there is little or no central coordination of either the acquisition of information or of the information itself.

During the summer, the staff at each area office plan bus assignments for the opening of schools in September. Load counts are the primary data source, however; and, on the basis of load counts, the staff make educated guesses of the number of buses to be assigned to schools and routes. As was shown in Chapter 8, they generally do a good job. However, as was also shown, 13 percent of the drivers reported that their buses were overcrowded, and 28 percent said the seating capacity of their buses was under-utilized during the first weeks after the opening of schools. September, then is a try-out or shake-down period. Thereafter, adjustments are made in bus assignments (load counts again), and by mid-year most, but not all, modifications have been made.

Bus routes may also be modified during the school year. For example, it might be observed that two under-utilized buses serving the same school frequently cross paths. In such a case, one or both buses might be rerouted for greater efficiency. However, since route maps are not regularly prepared, this situation would not necessarily be apparent during the year unless drivers reported it or, which is less likely, supervisors made the observation while in the field.

The process, then, is primarily one in which the historical route network is modified piecemeal. Each area transportation supervisor makes adjustments in bus assignments, routes, runs, and stops when and if the need for doing so is called to his attention in some way--and if there is time. Some gross inefficiencies may be noticed and eliminated, but other small inefficiencies could go on for years unnoticed and uncorrected. Again, there is no central coordination and, in fact, no one to do the coordinating.

Schedule Constraints

Bus assignments, loads, routes, and runs are determined to some extent by the opening and closing times of schools. If all schools opened and closed at exactly the same time, any one bus could make only one run to a high, junior high, middle, or elementary school. In MCPS, schools of different levels open and close at different times. The time between the opening of, say, a junior high and an elementary school is known as a transportation window. It is the time in which a bus can leave the junior high school where it has already dropped off pupils, make a run to pick up elementary school pupils, and get to the elementary school on time. If the transportation window is very wide, a bus can make longer runs or more runs than when the window is narrow.

The Division of Transportation has some influence over opening and closing times of schools. At present, hours are staggered in such a way as to permit most buses to make between two and four runs. The average is three: a high school run, a junior high or middle school run, and an elementary school run.

Deficiencies In The Present Planning Method

Load Counts

The load counts on which so many decisions are based cannot be considered planning data. They can be taken only after bus stops have already been established, routes drawn up, and buses assigned to schools and routes. But this is the reverse of how planning should be done. Under the best conditions, routes should be designed and stops established according to where pupils who are eligible live, but the Transportation Division does not get information about pupils.

Load counts might be useful for making estimates or projections for forthcoming years if they accurately reflected bus capacity and the number of pupils transported who actually live beyond walk-to-school boundaries, but they do not do so. MCPS regulations allow all pupils to ride school buses if space is available, and the County Council has made provisions for transporting pupils to private schools on MCPS buses when special routes and runs do not have to be created. MCPS pupils who should walk to school, but who live nearer to a bus stop than to school, can simply walk to a stop and get on a bus without being challenged. Children enrolled in a private school located near an MCPS school can also ride the buses without being questioned. In either case, the issue of available space is not considered, because load counts do not distinguish between those who are and those who are not eligible for transportation by virtue of living beyond the walk-to-school boundary. Therefore, transportation supervisors say load counts probably exaggerate the number of pupils who seem to be in need of transportation. This means that load counts may also exaggerate the need for buses and drivers and that all operational planning (and some budget planning) may be based on data that are known to be inaccurate.

Piecemeal Planning

As it is now done, planning or route modification is a piecemeal process. Each area transportation supervisor collects load counts and whatever other information he can get in his own area. Changes in bus assignments, stops, or routes are made within areas when and if the need becomes apparent and if there is time to review routes for even the most gross inefficiencies. Within any one area office, information is inaccurate, scattered among various records, or both. It is difficult for the area supervisor to determine the status quo, much less project into even the very near future.[3]

Since there is no central coordination, no one ever gets to see the countywide bus route network. Therefore, some problems that might be solved by reassigning or rerouting buses by geography rather than by area may not be identified or solved efficiently. Information that does get from area offices to the central office is virtually useless, because it consists primarily of load count data. Information obtained from central computer records is also largely useless for planning because, as has been said, reports are designed to meet MSDE, not MCPS requirements (and see later for a discussion of errors).

Some Indicators Of The Effects Of Deficiencies In Planning

Because so little reliable information and data are available, it is almost impossible to demonstrate the effects of deficiencies in the present method of planning. There are, however, some indications that the present method of planning, the lack of a planning staff, and the lack of information lead to excessive costs.

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[3] See Chapter 12. Secretaries and clerks cannot keep up with revising load counts and route descriptions. Route information and mileage data are in separate records. Drivers do not necessarily follow the routes as described or laid out.

Location of Bus Stops

Exhibit 13.1 shows parents' responses to a questionnaire item about the distance their child has to walk to a bus stop.[4] Also given are the distances which, according to MCPS regulations, separate those who are eligible for transportation from those who are not. For example, an elementary school pupil who lives within a mile of school is not technically eligible for transportation and is expected to walk to school.

Response patterns describe what amounts almost to curbside service for those who ride buses. When cases of no response are eliminated and all groups are combined, 97.5 percent of the parents said their child walks one-half of a mile or less to the bus stop and 89.5 percent said their child walks one-quarter of a mile or less. Patterns are quite similar at every school level. Apparently, only in very rare cases does a child who rides the bus walk even half the distance to the bus stop that children who are not eligible for transportation are expected to walk to school.

Such short walking distances can be achieved only if buses take circuitous routes. For example, children in a housing subdivision may walk to bus stops at the corners nearest their homes instead of to a central bus stop that would serve the entire development. The route through the development would obviously be longer than a route that involved only one central stop. The added mileage would increase all transportation costs.

Utilization of Load Capacity

Load counts, which can be accepted as reasonably accurate numerically, also suggest inefficiencies. The MORE team analyzed a sample of 295 bus runs in Area 2 to determine what percentage of bus passenger capacity is typically used.[5] Exhibit 13.2 shows the results of the analysis.

"Optimal" utilization could probably be considered to be between 61 and 80 percent of passenger capacity. While that range would be only between 34-44

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[4] It is probably safe to assume that parents know the approximate distance between home and the bus stop. However, to be conservative, if their estimates are doubled, nearly 90 percent of the pupils who ride buses would walk one-half of a mile or less to the bus stop, or half the distance an elementary pupil is expected to be able to walk to school.

[5] The analysis was of the number of children who were loaded on a given bus on one run, for example, an elementary school run. This is a more accurate way to measure utilization of capacity than finding mean loading by bus, etc.

Exhibit 13.1

PARENTS' ESTIMATES OF DISTANCE CHILD WALKS TO BUS STOP COMPARED TO DISTANCE CHILDREN ARE REQUIRED TO WALK TO SCHOOL

Reported Distances	Percentage[a] Of Parents	Required Walking Distance
ELEMENTARY AND MIDDLE SCHOOL		1 mile elementary 1.5 miles middle
Less than ¼ of a mile	92.0	
Between ¼-½ mile	5.0	
Between ½-1 mile	2.0	
More than 1 mile	0.2	
JUNIOR AND SENIOR HIGH SCHOOL		1.75 miles for both groups
Less than ¼ of a mile	85.0	
Between ¼-½ mile	11.0	
Between ½-1 mile	2.0	
More than 1 mile	0.8	
ALL SCHOOL LEVELS COMBINED[b]		
Less than ¼ of a mile	89.5	
Between ¼-½ mile	8.0	
Between ½-1 mile	2.0	
More than 1 mile	0.5	

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[a] Small percentages of parents in all groups did not respond.

[b] Cases of no response dropped, and therefore total is 100 percent of those responding in all categories.

Exhibit 13.2

PERCENTAGE OF PASSENGER CAPACITY UTILIZED ACCORDING TO LOAD COUNTS IN A SAMPLE OF 295 BUS RUNS

Percentage Of Capacity Utilized[a]	Percentage Of Bus Runs	Cumulative Percentage
0-20[b]	2	2
21-40	14	16
41-60	23	39
61-80	32	71
81-100	21	92
101-120	7	99
121-140	2	101[c]

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[a] The percentage of seats filled. If the percentage is greater than 100, the bus is overloaded, i.e., some passengers must stand.

[b] While the size of the bus does not matter here, 99 percent of the runs were made by the typical 55 passenger school bus. For a bus of that capacity, the percentages equal the following numbers of pupils:

10% = 5.5, 20% = 11, 40% = 22, 60% = 33, 80% = 44, 100% = 55

[c] Rounding error

pupils on the typical 55 passenger bus, scheduling and routing constraints may make it difficult or impossible to load more pupils. As can be seen in Exhibit 13.2, buses were loaded optimally on only 32 percent of the runs. If 81-100 percent of capacity is also allowed as "optimal", then on 53 percent of the runs (32 + 21) buses were optimally loaded.

In contrast, on 16 percent of the runs, buses were loaded to only 40 percent of capacity or less (cumulative percentage column). On 23 percent, they were loaded to between 41-60 percent of capacity. Thus, on 39 percent of the runs, the passenger capacity of the buses was under-utilized. Beyond 100 percent of capacity, a bus is overloaded and some passengers have to stand. Buses were overloaded on 9 percent of the runs.

If the results obtained in Area 2 generalize to the countywide bus route network, then the passenger carrying capacity of buses is under-utilized. This is not direct proof of inefficient planning and routing. The road network, schedule constraints, and other conditions that influence routing may make it impossible to load each bus optimally on each run. However, load data cannot be viewed independently. It has already been shown that pupils may be getting curbside bus service, which results in unnecessarily circuitous routes, many stops, and small numbers of children at each stop--all of which influence the time it takes for a bus to make a run. Given these conditions and a limited time in which to make a run (transportation window), it is doubtful that every large bus could be optimally loaded and still arrive at school on time. It is more likely that buses would have to carry smaller loads than they are designed to accommodate. And, of course, if this is true for a large number of buses, the size of the fleet has to be large enough to compensate for the inefficiencies. Again, this would mean additional capital costs, additional mileage, and an increase in all operating costs.

Overloading, which is not supposed to be allowed, is a probable indicator of a problem that has already been discussed: providing bus transportation to pupils who live within walking distance of a school (allowed) without regard for the availability of space on buses (not allowed). Overloading is not likely to occur, after all, early in a run or even mid-way through a run. Rather, it is most likely to occur when a bus is nearing the end of its pick-up route, a point close to the boundary of the walk-to-school zone. It is there that pupils who are supposed to walk are most likely to get on a bus and ride to school. Since there are no controls on who gets on a bus, they can easily do so. The result could be overcrowding. But as was discussed earlier, load counts are used to identify conditions which require some sort of modification. In this case, an "overload"--caused by pupils who should walk to school--could be taken as evidence that another bus has to be assigned to a route or will be needed the next school year.

Availability Of Information

It is clear that if planning is to be improved, the Division of Transportation has to have more and better information about pupils and about conditions like road building and home construction that will have an impact on pupil transportation. At present, either essential information does not exist in MCPS or there are no procedures for providing existing information to the Transportation Division.

Eligibility for Transportation

The first and perhaps most important information the pupil transportation staff should have is who is eligible for transportation. MCPS Regulation 215-1 states that a pupil who lives within what is considered walking distance of a school will not be eligible and that a pupil who lives beyond that distance will be eligible for transportation by school bus (see Exhibit 13.1 for limits). Considerable effort goes into establishing boundary lines, and each school year the transportation staff are frequently required to make precise measurements when parents acting alone or in neighborhood associations challenge the fairness or accuracy of the boundary line. However, as pointed out in Chapter 8, MCPS regulations do not specify who is responsible for determining a pupil's eligibility or how parents are to be informed of their child's eligibility for transportation.

Though there is no real control over pupils' eligibility, there is a process for entering a transportation code into pupils' central computer files. At the end of September, someone is supposed to make a code on school's pupil attendance record to show whether or not each pupil whose name appears on the record is "transported at public expense"--which is not at all the same as eligibility for transportation by MCPS regulations. Apparently the person responsible for coding could be a secretary, a clerk, or a teacher. Furthermore, if a teacher says to a class, "Hold up your hand if you ride the bus to school," the pupils themselves can determine how the record is coded. Attendance records are sent to the MCPS central office for data processing (optical scanning), and the transportation code is entered into each student's file. The code is entered just once and is not changed during the school year even when a pupil moves and becomes either eligible or ineligible for transportation.

The MORE team confirmed that coding is uncontrolled and sloppily done--when done at all. The "transported at public expense" code appears in the records of some pupils who have always lived within walking distance of school and have never ridden a school bus. It does not appear in the records of others who have always been eligible for transportation. In one sample case, the records for a middle school showed that none of the pupils were transported at public expense when, in fact, a large proportion are eligible for transportation and ride school buses. Many other examples of inaccuracies could be given. The point is, however, that accurate information about the number of pupils eligible for transportation--by administrative area, geographic area, school, or other unit--cannot be obtained from the central computer.

Eligibility Exceptions

A pupil who, according to regulations, lives within walking distance of school may be transported by school bus if the route the pupil must take is considered unsafe. In FY 1981, more than 6,000 transportation exceptions were granted at a cost of approximately $1,675,000.[6] The pupil transportation staff is responsible for identifying and reporting hazardous walking conditions (MCPS Regulation 215-1), for establishing routes and bus stops in the areas in which they occur, and for reporting to the division director the nature of the transportation arrangements and the numbers of pupils involved. Throughout, supervisors are to review recommendations with principals and a police coordinator. In addition, area associate superintendents are to review and approve decisions. In general, then, regulations do provide for a flow of information. However, the pupil transportation staff rarely receive updated information about pupils and cannot always manage to get out into the field to monitor changing road conditions. It is therefore highly unlikely that they can properly keep track of the more than 6,000 individual cases per year.

Walkbacks

"Walkbacks" are the pupils who live within walking distance of school, but who walk to a bus stop located beyond the walk-to-school boundary and ride the school bus. The impact of walkbacks on load counts and therefore on planning has already been discussed. However, it is appropriate to mention here that MCPS eligibility-for-transportation regulations are largely meaningless because all pupils are eligible to ride school buses. The Transportation Division has no way to identify pupils who are eligible because they live outside the walk-to-school boundaries (see immediately below), no way to identify walkbacks, and no way to tell if load counts accurately reflect the availability of space for walkbacks.

Identification

MCPS regulations direct principals to assign eligible pupils to buses, but a large number of principals do not actually do so (see Chapter 8). One possible control over who gets on the buses is therefore not exercised. Furthermore, MCPS does not issue bus passes or take other steps to identify pupils who are eligible for transportation because they live beyond the walk-to-school boundary. A driver therefore has no way of knowing whether or not a pupil who gets on the bus is eligible for transportation, or even if the individual is an MCPS pupil. It might be mentioned that it is reported that it is common practice for young people to use school buses as a kind of public transit system: to ride to school with a friend on one bus, to go home with another friend on a different bus, to take a convenient bus to get to a swimming pool or tennis club--all without regard for eligibility for transportation or bus assignment.

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[6] Source: Transportation Division reply to Council Executive Question 71, MCPS Pupil Transportation Statistics, FY 1979-FY 1982. The number of pupils transported by exception was reported to be 6,134, and the average annual per-pupil cost was reported to be $273.

Central Computer Records

In addition to the already mentioned transportation code, which is of little or no value, central computer records contain students' names, addresses, and other information which might be of value to the pupil transportation staff. There are, however, many errors which, again, were confirmed by the MORE team. Addresses recorded for some pupils do not exist in Montgomery County. In many cases, pupils have moved, but records have not been updated.

Until very recently, the accuracy of the computer records has not mattered greatly because area transportation supervisors have not obtained information from them. In FY 1982, at the request of one area supervisor, they did get printouts giving pupils' names, addresses, and school assignments. The supervisors reported that while the printouts are better than nothing at all, they are too bulky and the report format is not designed specifically to meet the needs of the transportation staff.

Principals

It might be supposed that the schools would be the primary source of information about pupils and transportation needs. However, as was shown in Chapter 8, MCPS Regulation 215-1 makes principals responsible for maintaining an accurate record of pupils transported by bus,[7] but does not make them responsible for providing the Transportation Division with a copy of the record.

The lack of a requirement has its expected effect. As shown in Exhibit 13.3, which gives the percentages of principals responding in given ways to questionnaire items, the overwhelming majority (75-82 percent) said they provide no information about regular pupils who are eligible for transportation. A majority (54 percent) also said they provide no information about pupils in special programs who must be transported.

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[7] Including, according to the regulation, each pupil's name, address, phone, grade, homeroom teacher, and bus on which pupil is authorized to ride.

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Exhibit 13.3

PERCENTAGE OF PRINCIPALS RESPONDING TO QUESTIONS ABOUT PUPIL TRANSPORTATION INFORMATION

Question	Response	Percentage Of Principals[a]
DO YOU PROVIDE THE FOLLOWING INFORMATION TO THE TRANSPORTATION DIVISION DURING A CURRENT SCHOOL YEAR TO ENABLE THE DIVISION TO PLAN ROUTES AND SCHEDULES FOR THE FOLLOWING SCHOOL YEAR:		
Number of pupils who will be eligible for transportation under the usual beyond the walking distance rule?	Yes	21
	No	75
Names of pupils who will be eligible under the beyond walking distance rule?	Yes	17
	No	80
Addresses of pupils who will be eligible under beyond walking distance rule?	Yes	17
	No	80
Number of pupils who live within walking distance but who will be eligible for or provided with transportation?	Yes	18
	No	82
Names of pupils who will get exceptions to walking rule?	Yes	23
	No	78
Addresses of pupils who will get exceptions to walking rule?	Yes	22
	No	78
Number of pupils in special programs for whom special transportation must be provided?	Yes	46
	No	54
Names of special program pupils who will be transported?	Yes	46
	No	54
Addresses of special program pupils who will be transported?	Yes	46
	No	54

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[a] Percentages will not always total 100 percent because of small percentages of no response to particular items.

It is probably not surprising that almost half of the principals said they do provide information about pupils in special programs. However, it is difficult to explain why between 17 percent and 23 percent said they provide information about regular pupils when it is not required and not the norm. Perhaps they believe erroneously that the information provided on the pupil attendance record eventually gets to the pupil transportation staff.[8] It is also possible that one or two of the area transportation supervisors have arranged to obtain information from some principals, though none reported doing so.

Educational Facilities Planning

The Department of Educational Facilities Planning and Development supplies all schools, divisions, and departments with frequently updated projections of what school enrollment is likely to be in the following fiscal year. Administrators, including managers of the Division of Transportation, use these projections in planning budgets. While the information is useful for some purposes, it is not specific enough to be used in planning routes.

The department is capable of supplying the Division of Transportation with enrollment data and with numbers of pupils who live within and beyond the walk-to-school boundary. However, it was reported that the information is obtained from the pupil data base in the central computer, which, as has been stated, contains many errors. The information is therefore not any better than that now being obtained from the central computer by the area transportation supervisors.

At the time of this writing, the department had just made available a series of maps which illustrate the MCPS 15-year comprehensive facilities plan. The maps show, by administrative area and level of school, the schools to be closed by year of closing, areas affected by school closings, and schools to which pupils from affected areas will be transferred. While the maps are easy to use as a quick reference, they do not provide enough detail to be useful in planning bus routes and schedules.

Facilities Planning gathers data on population movement, housing development, and other changes that might affect school enrollment in specific areas. These are, of course, the same things which have an impact on pupil transportation, therefore information about them is potentially important to the Division of Transportation. Members of the Facilities Planning staff provide the information to area transportation supervisors. They do so informally, however, not because they are required to do so by MCPS regulations or procedures. This means there is no formal control over the kind of information they must provide, when they should provide it, or the most useful way to present it (i.e., the reporting format which would be most useful to the Transportation Division).

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[8] But if principals did make this assumption, they did not answer the question as asked. The pupil attendance record does not provide information for the next school year.

Division of Transportation

Finally, the Division of Transportation itself collects or generates a large amount of data. In fact, the division is almost overwhelmed by data. However, as has been said, almost all of the data were collected to meet MSDE reporting requirements. It was not required that the information be useful for planning pupil transportation routes, the location of bus stops, or bus assignments. For this, the division is forced to rely on load counts and whatever other information can be obtained from the various sources previously discussed.

Since bus mileage and pupil transportation costs are directly related, mileage data should be used in operation planning. The length of routes should be known and monitored (see Chapter 12). So-called deadhead mileage (distance from starting point to the first pickup) should also be known because it may, among other things, influence where buses are parked. Miles per gallon of fuel, if known and monitored, could help determine bus assignments. For example, the least fuel efficient vehicles could be put on routes where driving conditions are most favorable.

The Transportation Division collects mileage data. However, as was discussed in Chapter 12, the mileage figures are gross mileage, not mileage by category of use: route mileage, deadhead mileage, mileage attributable to personal use of buses, etc. This information is therefore of extremely limited value and cannot be used in planning.

Because MSDE, for funding, required that route mileage be reported, the Transportation Division developed a system to obtain the data. It is said that three times a year each driver fills out a route mileage report. The reports are turned in to area transportation offices where records from all buses are compiled manually. Summary forms are sent from area offices to the division's central office where a transportation specialist compiles data from all areas, again manually. In this way, route mileage data, which would be useful for planning, are summarized and summarized yet again to the point of uselessness. The MORE team made the conservative estimate that this entire exercise costs MCPS at least $6,000 a year in salaries alone.

MORE Route Planning
And Mileage Reduction Study

Reducing Costs by Reducing Mileage

Reducing the number of miles travelled by school buses offers the only hope for reducing all pupil transportation costs simultaneously. The relationship between mileage and all other costs can probably be most easily thought of as a kind of equation in which

Miles =

hours of driving time for which drivers are paid
+ fuel consumption (and cost of fuel)
+ engine oil and lubrication
+ salaries of automotive service workers
+ replacement of parts that wear out in normal use (brakes, tires, etc.)
+ other mechanical maintenance (tune-up, repairs, road service)
+ salaries of automotive mechanics
+ distance or time in which a bus must be replaced (capital outlay)
+ salaries of operations and maintenance administrators and supervisors

= All Transportation Costs

The equation is applicable both to a single bus or the entire bus fleet. Thus, if a bus is driven more miles, the hours of driving time and the salary of the driver increase, more fuel is consumed, and so on for increases in all costs. If the bus is driven fewer miles, all costs decrease. As fleet mileage increases or decreases, all costs also increase or decrease.

No other single variable has this same effect. Reducing fuel costs, for example, while desirable in itself, would not reduce all costs. Even reducing the size of the bus fleet would not reduce costs if fleet mileage remained constant or increased. For example, if 600 buses travel about 10,000,000 miles a year, an annual average would be 17,000 miles per bus. If the fleet were cut in half but mileage were unchanged, each of the remaining 300 buses would have to average about 34,000 miles a year. This increased mileage would increase all other costs per bus, and total costs would be virtually the same as before.[9]

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[9] Some small short-term savings in capital outlay might be realized. However, buses would have to be replaced or engines would have to be overhauled more frequently. Some costs might increase. Since drivers would have to drive longer hours, they might have to be paid more overtime.

MORE Route Planning Study

The Division of Administrative Analysis and Audits contracted for an independent routing study to determine the effects of the following on route mileage and costs:

- Basing bus stops and routes on pupils' addresses instead of on load counts or other history
- Concentrating on reducing route mileage
- Enforcing existing MCPS transportation regulations

The study is presented in its entirety in Appendix B and is therefore only briefly summarized here.

The individual selected to perform the study was Mr. Ben Hartman, the supervisor of transportation of the Howard County (Maryland) Public Schools.[10] The purpose of the study and conditions under which it was carried out were as follows:

- To determine whether or not mileage could be reduced on the routes of the buses serving a single school, Kennedy High School
- Buses assigned and routes planned by the MCPS Transportation Division would serve as standards for comparison.
- Any new bus stops and routes planned by the contractor would be based on the following:
  - Addresses of pupils who attended the school in FY 1982
  - Walk-ride boundaries established by MCPS regulations
- All existing MCPS regulations would apply. No transportation exceptions would be granted except in cases in which the safety of pupils would be threatened; present cases of exceptions to be examined and walking routes field checked for safety.
- Any new stops or routes planned by the contractor would be field checked and proved safe for pupils and buses (no turns in face of traffic, etc.).

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[10] See Appendix B for reasons for selection. Mr. Hartman was previously employed by the MCPS Transportation Division and is familiar with the road network in Montgomery County and with conditions of bus operation in MCPS.

Exhibit 13.4

ACTUAL AND PROPOSED ROUTE MILEAGE[a] OF BUSES SERVING KENNEDY HIGH SCHOOL: FY 1982

(One Way Mileage, Morning Run)

Bus[b]	Actual Miles	MORE Study Proposed Miles
1	4.3	4.3
2	7.4	7.4
3	4.3	4.3
4	7.4	9.2
5	4.7	4.7
6	7.0	6.4
7	6.8	6.2
8	7.0	6.2
9	7.6	5.5
10	5.3	4.7
11	12.8	8.1
12	8.9	0.0[c]
13	8.0	8.0
14	5.9	5.9
15	8.7	6.8
16	4.9	7.3
17	5.1	5.7
TOTAL	116.1	100.7
DIFFERENCE		-15.4 miles
AVERAGE REDUCTION PER BUS		0.91 miles

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[a] In both cases, mileage includes "deadhead" mileage from depot to beginning of route. High school runs are the earliest and buses leave from depots, not from other schols as they do on later runs.

[b] Numbers are not actual MCPS bus numbers (see Appendix B).

[c] This route eliminated in proposed routing plan.

The area transportation staff, who were asked to identify a suitable school for the study, said that Kennedy High is a typical MCPS high school (enrollment, number of buses) and that the problems involved in routing buses to the school are no different than for other schools.

Results

Exhibit 13.4 shows the results of the study. In FY 1982, 17 buses were assigned to Kennedy High. On each morning run, they logged 116.1 cumulative one-way miles from depot to route to school. By basing bus stops and routes on where pupils live and applying MCPS regulations, the contractor was able to design new routes and effect the following:

- Reduction of cumulative one-way mileage from 116.1 miles to 100.7 miles, a difference of 15.4 miles (13.3 percent reduction)
- An average reduction of 0.91 miles per bus (though some routes were lengthened)
- Elimination of one route and therefore of one bus (bus 12 in the exhibit)

Projecting Results to Fleet

Exhibit 13.5 shows the reductions of mileage and costs that would result if the findings of this routing study were generalized to the entire bus fleet. At an average reduction of 0.91 miles per bus on only one run per day, there would be a reduction of 558.74 fleet miles per day. In FY 1982, maintenance and operating costs for school buses were $0.54 per mile, and therefore a reduction of 558.74 miles per day would reduce costs by $301.72 a day. In the 185-day school year, the reduction in costs would be $55,818--from a reduction of only .91 miles per day per bus on one run. However, each bus, on the average, makes six runs a day, three in the morning (high school, junior high or middle school and elementary school) and three in the afternoon. If an average of .91 miles were cut on each run, the annual reduction in fleet maintenance and operating costs would be $334,908.

The routing study dealt only with buses on regular education routes, not with special education buses. Therefore, in Exhibit 13.4, projections of reductions in mileage and costs are shown for regular education buses alone. In this case, the reduction of .91 miles on the runs of the 417 buses would reduce annual maintenance and operating costs by $227,454, a substantial amount even if costs were not reduced at all on special education routes.

While it is obviously important to reduce costs in any way possible, reducing mileage will have the greatest effect on all costs. But mileage can be decreased only if the entire bus route network is efficiently designed, and this can be achieved only through planning.

Exhibit 13.5

PROJECTIONS OF REDUCTIONS OF MILEAGE AND COST FOR ENTIRE BUS FLEET BASED ON MORE ROUTE STUDY AND FY 1982 DATA

All Buses On Routes

Mean reduction of mileage, one run per day	0.91 miles per bus
Reduction for 614 buses, one run per day [a]	614 x .91 = 558.74 miles
Maintenance and operating costs per mile [b]	$0.54
Daily reduction in cost, one run only, 614 buses	558.74 x .54 = $301.72
Reduction in cost, 185 school days, one run only, 614 buses	$301.72 x 185 = $55,818
Average number of runs per bus per day [c]	6
ANNUAL REDUCTION IN COST	$55,818 x 6 = $334,908

Regular Education Buses Only

417 buses at reduction of .91 miles per day, one run [d]	379.47 miles per day
Reduction for 6 runs per day	2276.82 miles
Reduction for 185 days	421,212 miles
ANNUAL REDUCTION IN COST	421,212 x $0.54 = $227,454

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[a] There were 614 buses on routes in FY 1982.

[b] Cost per mile was obtained from Transportation Division report TR-4 for 1982.

[c] On the average, each bus makes six runs per day, three in the morning and three in the afternoon.

[d] There were 417 regular education buses on routes in FY 1982.

Discussion

The Present System

The present system of planning routes and resources may result in increases rather than to decreases in mileage and therefore in all costs. Year after year, problems have been solved by adding buses and drivers and increasing fleet mileage. What planning has been done has been backwards, i.e., not based on information about what pupils are eligible for transportation and where they live, but on after-the-fact load counts that merely show how many pupils (eligible or ineligible) ride the buses. It is a system which is almost guaranteed to produce inefficiencies.

Staff and Area Administration

It was shown in Chapter 12 that the county's Ride-On system, with its 90 buses, employs 11 full-time planners and analysts. The MCPS Division of Transportation, with more than 600 buses and drivers, employs not one full-time planner. Furthermore, the managerial, supervisory, and clerical staff of the division has been so reduced that staff members have difficulty dealing even with day-to-day route modifications. The situation encourages finding quick and easy solutions to problems: adding buses, adding miles, increasing costs.

As was also shown in Chapter 12, because pupil transportation is administered by school administrative area, the central office is not staffed or organized to manage the system. Records are scattered among area offices, and no one has an opportunity to see the larger picture, the countywide bus route network. Therefore, inefficiencies which might increase costs are not likely to be detected.

Information

Information on which efficient planning should be based is simply not available. The pupil transportation staff is therefore forced to rely primarily on load counts. This, in turn, means that planning has to be done in reverse, again almost guaranteeing inefficiencies. If the situation is to be changed, it will take the work and cooperation of several departments and divisions to supply the information the Division of Transportation will need if it is to have the capacity to plan.

Regulations and Procedures

Even the most efficient planning will not result in a reduction of pupil transportation costs if MCPS regulations and procedures are not revised and enforced. At present eligibility or non-eligibility for transportation as defined by regulations is meaningless. All pupils are eligible and there are no controls over who rides school buses. The regulations that make principals responsible for assigning pupils to buses and for keeping accurate records are not enforced. In any case, unless pupils who belong on given buses can be identified, assigning them to buses would be nothing more than a futile exercise. Without regulations and procedures, the Division of Transportation will probably not get the information it needs for planning.

MORE Routing Study

The MORE routing study demonstrated that substantial reductions in mileage and in maintenance and operating costs can be made by using pupils' addresses when planning routes, concentrating on reducing mileage, and enforcing already existing MCPS regulations. The study was not intended to show or suggest that the area transportation staff could not do the same job that was done by the contractor if they had the opportunity. It has been shown in this chapter, however, that they do not have that opportunity at present. They lack the time to concentrate on one small segment of the route network and must generally rely on load counts instead of on accurate addresses of pupils when planning routes and schedules. Furthermore, the contractor was able to act independently and "enforce" MCPS regulations, which the pupil transportation staff cannot always do.[11]

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[11] In one case, the contractor disallowed transportation exceptions for a group of high school pupils who live within the walk-to-school boundary, but who are now transported by bus even though their homes adjoin a well used, paved public walkway that leads to the school.

Recommendations

The major recommendation that logically emerges from the findings presented here is that the Transportation Division should be provided with the staff, mechanical support (word processor, perhaps computer, etc.), and other resources to establish a central planning staff. However, this recommendation will be discussed further in Chapter 15. The following are other recommendations derived from the findings:

- A committee or task force should be formed to determine the data and other information needs of the Division of Transportation and to develop a calendar of target dates for meeting those needs. The task force should be made up of the director of the Division of Transportation, a representative of the Department of Management Information and Computer Services, a representative of the principals' associations, and a representative of Educational Facilities Planning and Development.

- It has been recommended elsewnere that MCPS regulations should be reviewed and revised and that additional regulations should be written when appropriate ones do not exist. The same team or task force should include a review of the following:

  - How eligibility for transportation is to be determined and by whom.

  - How pupils and parents are to be informed of a child's eligibility and by whom.

  - Who is responsible for entering an eligibility code into pupils' computer records and when and how revisions are to be made in computer codes.

  - Responsibility of principals in assigning pupils to buses, for keeping up-to-date records, and for providing the Transportation Division with information about pupils. (But there may be another way to provide the information. See previous recommendation.)

  - Eligibility or non-eligibility of all pupils to ride buses.

- The task force on information (see first recommendation) should investigate a pupil identification system, particularly identification that can be produced by computer. Recommendations should be included in its final report.

CHAPTER 14

A DISCUSSION OF CURRENT METHODS UNDER CONSIDERATION FOR REDUCING COSTS

Introduction

The Transportation Division staff, as has been said, are expected to engage in long-range planning and to propose the adoption of methods or technologies that may reduce pupil transportation costs. At the request of the Board of Education, the staff are attempting to carry out consolidation of bus stops. Also because of the interest of members of the board, the division director, in a budget memorandum, has made a tentative and very preliminary proposal for reducing the size of the bus fleet by altering school schedules. And finally, the division staff have, for some time, been investigating computer routing of buses. It is appropriate to review each of these methods for reducing costs in light of what has been said about planning and information in the previous chapter.

Consolidation Of Bus Stops

MCPS Regulations

In the previous chapter it was shown that the vast majority of pupils who ride school buses probably walk a far shorter distance to a bus stop than even elementary school pupils are expected to walk to school. This means that some buses may be taking unnecessarily circuitous routes. MCPS Regulation 215-1 makes the following statement which paves the way for increasing walking distances, consolidating stops, and reducing bus mileage (all are quoted, but not necessarily in full):

- Children are expected to walk safely without sidewalks in many areas...Buses are not an alternative to sidewalks in a subdivision...

- Children are expected to be able to walk to centralized pickup points to await the arrival of school buses.

- [Bus] routes will not be extended unless the walking distance from the home to an established bus stop is greater than [the distance that pupils of the same grade who are not eligible for transportation are expected to walk to school].

Work to Date and Effects

Since the Board of Education had expressed interest in consolidating stops, the superintendent reported in a memorandum (December 9, 1980) that he had instructed transportation supervisors, when planning routes for the next school year, to review routes and examine the possibility of consolidating stops. This planning is usually done in the summer. Unfortunately, as it turned out, it would have been difficult to pick a worse time than the summer of 1981 to try to consolidate stops. Administrative areas were themselves being consolidated from five to three, and offices were being moved. Some of the pupil transportation staff were new to and unfamiliar with the areas to which they were assigned. To make up for the lack of staff, the Department of School Services hired three college students to carry out stop consolidation with the assistance of area transportation supervisors. Two students quit before finishing the job. The one who worked through the entire summer was able to consolidate stops only in what is now part of Area 2.

Despite the problems, in FY 1982 the pupil transportation staff were able to consolidate, relocate, or eliminate 225 stops at an average saving of 0.5 miles per stop.[1] The division director estimated that this would result in a reduction of 10,813 miles and of $12,488 in costs. He estimated that in FY 1983 savings would be $30,000.

Future Prospects and Recommendations

Decreasing bus mileage by consolidating some bus stops will certainly decrease pupil transportation costs. Therefore, transportation supervisors and their staff should continue this program. However, stop consolidation should be the end product of efficient route planning, not the starting point. That is, routes should be planned and stops should be established according to where pupils who are eligible for transportation live. Under current conditions, the staff cannot always plan in this way because they lack some information, manpower, time, and central office coordination.

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[1] Source: Transportation Division's response to County Executive Question 70.

School Schedules And Reducing
The Size Of The Bus Fleet

The Line of Reasoning

In Chapter 13 it was pointed out that school schedules serve as a constraint on the number of runs each bus can make. The greater the difference in opening times and closing times between schools of different levels, the more runs each bus can make. The more runs each bus can make, the fewer buses and drivers are needed. Therefore, it is argued, costs can be reduced substantially by altering school schedules to permit the greatest number of runs per bus.

The Proposal

From time to time, school schedules have been changed to permit some buses to make more runs. However, while discussing the FY 1983 budget, the Board of Education asked the Division of Transportation to show what the effects of "optimal" schedule changes would have on costs. Therefore, in a memorandum (March 18, 1982), the director of the division presented "a radical approach" to scheduling the opening and closing times of schools. The following points are paraphrased:

- In FY 1983, buses and drivers must be added to provide transportation for additional pupils.
- The transportation staff and the director have proposed changes in school schedules that will reduce the number of additional buses needed, though more buses will have to be added in any case.
- It is not possible to effect significant savings by adjusting schedules within present limits. Therefore, a "radical approach" is needed, beginning in FY 1984.
- Some high schools would open as early as 7:15 a.m. and some middle and elementary schools would close as late as 4:15 p.m. The difference in opening and closing times among schools of the same grade level would be as great as 1 3/4 hours.
- This would permit each bus to make between six and eight runs instead of the present average of three.
- Therefore, the number of buses and drivers could be reduced by as much as 25 to 35 percent, and the budget could be reduced below "that which would be needed" by 15 to 25 percent (both estimates).

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In fairness, it must be emphasized that this is a very tentative plan. The Transportation Division staff have not yet had an opportunity to work out all of the details or identify all of the problems that might be caused if a radical plan were actually implemented.

Questionable Predictions

The estimates of savings of 15 percent to as much as 25 percent of the budget are based on some questionable predictions. The Division of Transportation does not now have the ability to look at the entire bus route network and does not have information or data about such things as the loss of riders in some areas compared to gains in others, deployment or possible redeployment of buses among areas, or the utilization of the carrying capacity of the present bus fleet. It is remotely possible that the pupil transportation staff can predict that still more buses and drivers will be needed in FY 1984. The justification, as usual, is that more pupils will have to be transported. However, this is not in itself evidence of the need for more buses and drivers (see Chapter 13).

Furthermore, it is not claimed that the size of the bus fleet will actually be reduced. Instead, it is said that adjusting schedules "will reduce the number of buses and drivers that will need to be added." But if there are no accurate data to show how many buses are actually needed, the claim can never be substantiated.

More Miles and Greater Costs

Not only are predictions questionable, but there is an inherent contradiction in the plan as it now stands. If each bus made six to eight runs instead of the present average of three, mileage per bus would approximately double or more than double. All costs per bus would increase, and there would be little or no reduction in pupil transportation costs (see Chapter 13).

Special and Field Trips

As presented, the plan does not make provisions for the many special and field trips which now account for so much mileage and drivers' time. Presumably, they would continue. If opening and closing times of schools were spread out over most of the day and buses were making home-school-home runs throughout that time, the number of buses and drivers available for these trips would be limited. Therefore, it is likely that extra buses that are not used on home-school-home runs would be needed. This would mean an increase in the size of the fleet and in the number of drivers, which would again increase costs.

Problems with Schools

The plan, if presented formally, would probably be opposed by principals. Exhibit 14.1 shows principals' responses to questionnaire items about opening and closing times of schools. Principals are interested in economy, as witnessed by the fact that 59 percent said that if savings can be realized, schools should open and close at different times regardless of educational and social concerns. However, 59 percent also said that the maximum time difference between schools of the same type should be 30 minutes and another 24 percent said it should be between 30 and 45 minutes. Or, in short, principals would support what already exists, a difference of less than an hour, not the nearly two hours suggested in the radical proposal. Principals also generally do not want the Division of Transportation to make decisions about school opening and closing times, though a majority agree that the division and the transportation supervisors should have a "lot of input" into decisions.

Other problems with schools, pupils, and parents would undoubtedly surface if the proposal were made formally. To get to school by 7:15, some pupils would have to be at the bus stop very early indeed. Elementary school pupils whose schools closed late in the afternoon would, from about November to February, have to walk from the bus stop to home in the dark.

Evaluation and Recommendations

At some time in the future, MCPS may have to consider a plan as radical as the one presented here. At present, however, the plan has the effect of shifting a burden from the Division of Transportation to the schools. It is not a substitute for the kind of planning the division staff should be capable of doing. The plan should therefore be held in reserve, to be examined again when and if the division has the capacity to review the entire route network; obtain adequate information about pupils; and base projections of needs on something more substantial than load counts, guesses, and estimates.

Computer Routing And Scheduling

An Emerging Technology

In recent years, a number of private companies have developed software packages or systems to do school bus routing and scheduling by computer. Some school districts throughout the country have tried or are currently trying these systems. Before instituting funding by block grants, MSDE encouraged Maryland school districts to investigate computer routing and seemed to promise funds for trials. Encouraged by MSDE, the Division of Transportation and the Department of Management Information and Computer Services began to

Exhibit 14.1

PRINCIPALS' RESPONSES TO QUESTIONNAIRE ITEMS ABOUT OPENING AND CLOSING TIMES OF SCHOOLS

Question		Percentage Of Principals[a]
Which of the following is closest to your opinion?	Regardless of possible economies, all schools of the same type must open and close at about the same time for educational or educationally related reasons.	10
	Regardless of economies, it is desirable (but not essential) for all schools of the same type to open and close at about the same time for educational and other reasons (athletic, social, etc.).	30
	If savings in transportation can be realized, schools of the same type should open and close at different times.	59
If schools of the same kind opened at different times, what is the maximum difference that should be allowed?	30 minutes	59
	Between 30-45 minutes	24
	Between 45-60 minutes	7
	More than 60 minutes	7

How much decision-making authority or input should each of the following have in determining the opening and closing hours of schools?

	Percent of Principals[a]			
	Make Decision	Lot Of Input	Some Input	No Input
Deputy Superintendent	37	15	31	12
Department of School Services	0	21	53	21
Transportation Division	6	50	39	3
Area Associate Superintendent	39	40	18	1
Area Transportation Supervisors	10	62	26	0
Principals	18	69	12	0

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[a] In all cases, small percentage of no response.

look into computer routing. Now that MSDE provides block grants, it has apparently lost interest, probably because it would no longer realize the major share of any savings that might come from the technology. Nonetheless, the Transportation Divison staff have continued to investigate computer routing. Unfortunately, it must again be said that further investigation at this time would be a waste of time and money. Enough is already known to make it clear that MCPS is not ready for computer routing.

MORE Team Findings

Independently, the MORE team searched the literature, called other school districts, and analyzed companies' promotional materials. Some generalities emerged from this study: Each company claims that its system reduces transportation costs. Most say that reductions are achieved by improving schedules, increasing the number of runs made by each bus, and thereby decreasing the size of the bus fleet (or some variaton of this theme). The occasional company will claim that its system can produce a decrease in fleet mileage. However, most do not claim that fleet mileage is reduced, which casts doubt on whether most systems can actually reduce total transportation costs.

Most systems are comparatively expensive to set up and operate. One company, whose representative made a presentation in MCPS, would charge an initial set-up fee of between $340,000 and $390,000 and an annual fee thereafter of about $166,000. Another, whose representative talked with Transportation Divison staff, would charge a set-up fee of $340,000 and annual fee of more than $190,000. However, one company, whose representative talked to both the Transportation Division staff and to the MORE team, would charge a one-time fee of less than $100,000. This company is one that claimed its system could reduce fleet mileage.

Packages or systems vary widely in what they can do. Some are truck routing systems, sometimes, but not always, poorly modified to handle school bus routing. Some are expressly designed for routing school buses but cannot handle systems as large as the MCPS bus route network. Others cannot handle special education routes well. Finally, some are apparently well designed and capable of handling large route networks and a variety of special problems. However, sorting the good from the mediocre and the mediocre from the bad takes time, effort, cost, and considerable expertise.

Perhaps the most important finding is that the following are essential for setting up and operating most computer systems:

- A countywide street grid showing, street by street and road by road, all constraints on transportation (rail crossing, narrow streets, one way streets, etc.)
- Accurate identification of pupils who are eligible for transportation
- Accurate street address of each pupil eligible for transportation

While not essential for the operation of a computer system, it would also be necessary to have accurate mileage and cost data before trying computer routing so that it would be possible to prove whether or not costs were actually reduced. But it should be noted that all of this information and data are needed for planning, routing, and scheduling with or without a computer.

Information from School Districts

Since computer routing and scheduling of school buses is a comparatively new technology, some school districts the MORE team contacted are using computers but do not have enough data to show the effect, if any, on costs. Others had just adopted one system or another and had no data at all. Some have tried computer routing and given it up, vowing never to try it again. (The director of transportation in one Florida school system said, "The computer had buses lined up in the Gulf of Mexico.")

Evaluation and Recommendation

It must be remembered that a computer is a tool and that computer routing and scheduling of buses is a means to an end. At present, neither the Transportation Divison nor MCPS has the information a private company would need to set up and operate a computer routing system. Using the present student data base, with its many errors, would make it difficult to evaluate fairly any system being tried.[2] It will be some time in the future before the essential information can be made available. In addition, while the Division of Transportation staff can evaluate the routes and schedules produced by a computer routing system, they cannot be expected to have enough expertise to evaluate the software or the compatability of a company's hardware with the central MCPS computer. When the time comes that a computer system should be tried, they will need help from other MCPS units. Computer routing is therefore a potentially good idea which needs to be held in reserve for a future in which the Divison of Transportation has the organization, staff, and information needed to be able to use the technology.

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[2] Computer routing was apparently a failure in some school districts because, as in MCPS, the information in the student data base was inaccurate.

Discussion

This discussion of attempts and plans to reduce transportation costs illustrates the fact that the division does not have the capacity to do some types of long-range planning. The stop consolidation program has had some limited success and should certainly continue, but does not, in itself, promise large reductions in pupil transportation costs. The estimated $12-thousand to $30-thousand savings represent only between 0.09 and 0.2 of 1 percent of the division's $14-million budget. More substantial savings can be realized through more efficient route planning (see Chapter 13) with stop consolidation as a by-product. The radical scheduling proposal passes the burden of planning from the Transportation Division to the schools and is probably unacceptable because of the problems it would create for principals, pupils, and parents. Centralized computer scheduling is not practical under present conditions of operation or with the scanty information now available.

Recommendations

- The stop consolidation program should continue, and the division should be provided with the information and planning capacity that would enable the staff to design routes more efficiently.
- The radical proposal for altering school schedules should be set aside for later consideration only if it becomes financially necessary.
- Time and effort should not be devoted to investigating computer routing until the division develops the information base and has the centralized planning capacity that make computer routing feasible.

CHAPTER 15

A PROPOSAL FOR CENTRALIZING AND REORGANIZING PUPIL TRANSPORTATION

Introduction

It has been shown in previous chapters that MCPS is attempting to operate a major transportation system with a minimum of staff, planning, management, and supervision. The pupil transportation staff are trapped in a self-generating cycle in which they must constantly respond to demands and situations over which they have little control. They are barely able to cope with day-to-day operations. With no planning capacity, they must solve problems in ways that increase the number of operational problems and probably increase costs as well. As the number of problems increases, staff members are less able to cope with them.

The MORE team believe that the way to stop perpetuating this cycle year after year is to centralize, reorganize, and very modestly increase the size of the pupil transportation staff. Before discussing the MORE proposal, it is necessary to review briefly the many problems the plan is intended to solve.

Summary Of Major Problems

Exhibit 15.1 summarizes the major problems in transportation that have been identified in previous chapters. To summarize still further, the following are probably the greatest managerial problems faced by the pupil transportation staff:

- Separation of managers and supervisors from the central office staff and from one another
- Artificial creation (area office administration) of a need to coordinate among offices superimposed upon a real need to coordinate transportation
- Inability of the staff to plan for and deal with transportation countywide

Exhibit 15.1

A SUMMARY OF MAJOR PROBLEMS IN PUPIL TRANSPORTATION

o **Organization**

- Instead of facilitating management and supervision, the organizational structure, staffing, and deployment of staff provide the impediments.
- Managers and supervisors are separated from the division's central office and from one another.
- Buses, drivers, and aides are separated from managers and supervisors, there is no constant supervision at depots, and there is little field supervision.
- The need for coordination is vastly increased while the staff's ability to carry out coordinated planning and to coordinate operations is decreased.
- Area administration makes it impossible for the division to carry out centralized planning or to deal with the bus route network as a whole. It prevents dealing with transportation by geography or by other units more logical than administrative areas.
- Assigning transportation supervisors to school administrative offices creates conflicts in administration and decision making which undermine the authority of Transportation Division managers and supervisors.

o **Staffing and Working Conditions**

- The managerial, supervisory, and clerical staff is too small.
- Staff duties do not reflect the realities of operation under decentralization and area administration.
- Area administration divides an already too small staff into small units that do the same jobs in three different places. This further reduces their efficiency and prevents specialization of labor.
- Staff members cannot and do not do all of the tasks assigned or that need to be done.
- Constant interruptions, especially telephone calls, prevent staff members from carrying out tasks which should take continuous periods of uninterrupted thought and work.

o **Supervision**

- There are no provisions for constant supervision at depots
- Supervisors cannot carry out field supervision responsibilities because the workload at separate area offices is too great.

o **Special Education**

- Special education and regular education compete for a seriously limited amount of staff time.
- Special education transportation is partly centralized, but area offices are responsible for the greater number of programs and pupils.

o **Planning**

- The county's Ride-On system employs 11 planners for a fleet of 90 buses. The MCPS transportation Division, with a fleet of more than 600 buses, does not have even one full time planner.
- The division does not have the ability or the information to carry out efficient operational and long range planning.

o **Training**

- Training of drivers is marginal. The training given to aides is entirely inadequate.
- Continuing certification training does not meet MSDE standards.
- Refresher training, especially in defensive driving, is not provided.
- Training is not coordinated with accident investigation and accident prevention.
- Though training of various kinds is needed, training is not coordinated.

- Lack of information and therefore of planning capacity even in area offices
- Too small staff too widely scattered, resulting in reduced efficiency
- Limited ability of staff to practice even essential division of labor, e.g., supervisors who do not have time to supervise
- Divided area staff responsibility for buses, drivers, and aides assigned to different areas but stationed at a single depot

All of these problems must be solved if the Division of Transportation is to gain control over operations and therefore also over costs. Since they form a web of cause and effect, the problems cannot be attacked and solved piecemeal. For example, because the division does not get information about pupils, the area staff must rely on load counts. Because load counts are misleading, it is possible that more buses than are actually needed may be purchased and assigned to routes. As the numbers of buses and routes increase, the staff face more managerial, supervisory, and coordination problems. Under present conditions, providing the staff with information about pupils--the apparent first link in the causal chain--would not solve the various problems or reduce costs, because another problem intervenes: There are too few staff members in each of the area offices to enable anyone to analyze pupil data, plot the data on maps, and design routes and schedules according to where pupils live.

Again, then, problems cannot be dealt with individually. Any proposal, plan, or course of action must deal with all problems simultaneously and either provide solutions or create conditions in which it is possible for the pupil transportation staff to find solutions in the future.

Brief Description Of The MORE Plan And The Argument For Centralization And Organization By Function

Outline of MORE Plan

The MORE team believe that their proposal attacks all pupil transportation problems simultaneously. At a minimum, the plan requires the following:

- Complete separation of transportation and area administration
    - Elimination of area offices and of area assignments, and elimination of role of areas in transportation management
    - Elimination of job titles that include reference to area
    - Assignment of buses, drivers, and aides to depots only, not also to areas

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Exhibit 15.2

DIAGRAM OF MORE REORGANIZATION PROPOSAL: ONE CENTRAL OFFICE, FOUR DEPOTS

DIRECTOR
TRANSPORTATION DIVISON

PUPIL TRANSPORTATION SUPERVISOR

Planning and Data Analysis Unit

Community Relations Unit
(Special telephone)

Training and Field Service Unit

Bus Operations Unit

- Communication Service (radio/phone)
- Field and Special Trip Service
  (Special telephone)
- Regular Education Operations
- Special Education Operations

At Depots

Dispatchers

Route Supervisors

Relief Drivers

Drivers and Aides

- Centralization of the present area staff in one facility
  - Assignment of all present area office staff members to one building but not necessarily to the present central office of the Transportation Division at Shady Grove Road
  - Creation of the position of pupil transportation supervisor (instead of the present supervisor of bus operations) and assignment of the supervisor to the centralized pupil transportation office or building
- Organization of the pupil transportation staff into functional units
- Addition of six central office staff positions (above FY 1983 staff)
- Upgrading of some extant positions
- Creation of the position of dispatcher and assignment of one dispatcher to each depot (not included in 6 positions in central office, but obtained by upgrading extant positions)
- Assignment of a limited number of route supervisors to each depot
- Formation of a pool of relief drivers and assignment of relief drivers to depots

The organizational structure proposed by the MORE team would be as shown in Exhibit 15.2. The pupil transportation supervisor, acting under the director of the division, would be the chief administrator of pupil transportation. The functional units are those which the MORE team believe to be essential for efficient division of labor (see later description of responsibilities). Each unit would be supervised by an experienced staff member with rank equal to that of a present area transportation supervisor.

At each depot, a dispatcher, also with rank equal to that of a present area transportation supervisor, would control buses, drivers, and aides. Route supervisors and relief drivers would also serve under the dispatcher, but could be assigned duties by other unit heads working through the dispatcher.

Benefits of Centralization

Severing the bond between transportation and administrative areas and centralizing the pupil transportation staff would immediately solve many problems. Provided that the division received the support of the Board of Education, a layer of "external management" and therefore conflicts in decision making could be eliminated. Since managers and unit supervisors would be in one place, the present artificially created need for coordination among widely scattered offices would also be eliminated. Free of the constraints of administrative areas, the staff would also be able to plan routes by geographic boundaries, population clusters, or by other units more logical than administrative area. Supervision would be made easier because buses, drivers, aides, route supervisors, and relief drivers would be assigned to depots alone, not to both depots and administrative areas.

Organization by Functional Units

The advantage of specialization of labor as a means of increasing staff efficiency is so well known that it needs no lengthy discussion here. However, specialization can increase efficiency only if it is specialization by function. That is, the pupil transportation staff already practices a kind of division of labor. In each office, the staff are specialists in a particular administrative area. But in each office, the staff are responsible for all jobs from route planning to community relations. Everyone has to be a jack-of-all trades, and no one can concentrate on one task for very long without interruption. This diminishes the efficiency of an already too small staff. This would also be true if a centralized staff were divided into units and each unit were made responsible for, say, a geographic area or a group of high schools. Within a unit, a necessarily small staff would continue to be responsible for all jobs.

In contrast, specialization by function would enable one unit to concentrate on one task without interruption. For example, the community relations unit would handle all requests or complaints from parents (see later description). The unit responsible for bus operations would be freed from dealing with these calls and be able to concentrate on daily operational problems of the entire bus fleet. In turn, of course, the community relations staff would not have to take calls from stranded drivers, send radio messages to route supervisors, or arrange for field trips.

A Summary of Benefits

As has been said, the MORE team believe that their proposal attacks all pupil transportation problems simultaneously. Exhibit 15.3, which is partly derived from Exhibit 15.1, summarizes the major problems that would be solved or mitigated. Some, like the present separation of managers and supervisors from the central office and from one another, would be solved immediately. Others, like the staff's present inability to carry out countywide planning, would not be solved immediately because it would take time for the planning unit to develop procedures for gathering information and establish a useful data base. However, the creation of a planning unit and the ability of the planning staff to concentrate on planning would make it possible for them to gather information that is not now available and, eventually, to use it to improve operational efficiency.

There are three problems the MORE plan would only mitigate: understaffing, the inability of a too small staff to perform all essential tasks, and competition of regular and special education for a limited amount of staff

Exhibit 15.3

MAJOR PUPIL TRANSPORTATION PROBLEMS SOLVED OR MITIGATED BY THE MORE PROPOSAL[a]

Major Problem	Solved	Mitigated Only
o Managers, supervisors separated from central office and one another	x	
o No constant supervision at depots	x	
o Need for coordination increased, staff's ability to coordinate decreased	x	
o Inability of staff to carry out countywide planning or plan other than by administrative area	x	
o Managerial, supervisory, and clerical staff too small		x
o Staff duties do not reflect operational realities	x	
o Too small staff scattered, staff cannot perform all assigned tasks		x
o Constant interruptions, staff cannot devote continuous time to essential tasks	x	
o Inadequate field supervision	x	
o Regular and special education compete for seriously limited amount of staff time		x
o Area offices responsible for most special education transportation	x	
o Division has no ability to carry out long range planning	x	
o Training inadequate and uncoordinated	x	

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[a] Parallels Exhibit 15.1, but concentrates on major problems.

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time. While specialization can increase staff efficiency, it cannot entirely compensate for understaffing. Therefore, the success of the MORE plan--or of any attack on the division's problems--depends on increasing the staff. Since this is such an important topic, it will be treated separately later in this chapter.

MORE Proposal: Description Of Functional Units And Staff Responsibilities

Exhibit 15.4 shows the functional units proposed by the MORE team and the responsibilities of each unit's staff. In each case some additional explanation is required. However, it is assumed that ample justification for each function or unit has been given in previous chapters and that extended discussion is not needed here.

Pupil Transportation Supervisor and Staff

The director of the Division of Transportation has pointed out the need for a mid-level administrator to be responsible for pupil transportation, and the Board of Education has tentatively approved the position of Supervisor of Bus Operations to fill that need. The MORE team agree that the position is needed, but believe the position should be titled Pupil Transportation Supervisor to reflect the fact that the administrator would be responsible for all pupil transportation functions, not for bus operations alone.

Exhibit 15.4 shows that the supervisor's secretarial and clerical staff would be responsible for preparing the payroll, a complex and time consuming task under present conditions. The assumption here is that a relief driver pool would be created and that relief drivers would work regular hours. Dispatchers at the depots would simply check daily attendance, record absences, and send the reporting forms to the central office for processing. The payroll would therefore be like any other supportive services payroll in MCPS. There would still be a substitute payroll, but it should not present problems of the magnitude of the present one, especially since dispatchers could keep records on simplified forms.

Planning and Data Analysis

The formation of this unit would offer the best hope that transportation costs would eventually be brought under control because it would give the division the planning capacity it so badly needs. Staff members would be responsible for obtaining and analyzing the information and data the division does not now

Exhibit 15.4

MORE TEAM PROPOSAL:
FUNCTIONS AND DUTIES

PUPIL TRANSPORTATION SUPERVISOR AND STAFF

- Carry out instructions of Director of Transportation Division and coordinate work of units
- Prepare entire payroll (including drivers, substitutes, aides)

PLANNING AND DATA ANALYSIS UNIT

- Set up, in cooperation with computer center, pupil data base
- Maintain liaison with all MCPS units capable of providing essential information about schools, pupils, and conditions affecting transportation
- Maintain liaison with metropolitan and county planning units, police department,and other organizations capable of providing information
- Collect and analyze all data obtained from transportation operations
- Plan routes and schedules in cooperation with bus operations unit
- Plan resource needs

TRAINING AND FIELD SERVICE UNIT

- Plan and coordinate all training for drivers, aides, and (if necessaary) for other members of pupil transportation staff
- Carry out in class and behind-wheel training for drivers and aides except training in special education problems (which unit coordinates)
- Carry out required 24-month behind-wheel supervision of drivers
- Investigate all accidents and analyze accident information
- Coordinate training programs and accident prevention program

COMMUNITY RELATIONS UNIT (Provided with special phone lines for incoming calls)

- Collect and maintain reference file of all MSDE, MCPS, and other regulations or laws that deal with transportation services to be offered and limits of services
- Maintain up-to-date maps showing boundaries between walk-to-school and bus-transportation zones (or obtain from planning unit)
- Maintain reference file of individuals or offices to call to find solutions to problems
- Handle all inquiries, complaints, etc. from parents or public
- Arrange for rapid solution to and follow up of problem
- Note: Parents and public would be given one number to call, and the Community Relations Unit would be a central clearing house.

Exhibit 15.4 (cont.)

BUS OPERATIONS UNIT

- Communication Service (Provided with radio and special telephone)
  - Communicate with dispatchers, supervising auto mechanics, route supervisors by radio and, when necessary, by telephone
  - Take emergency calls from drivers and relay information
- Field and Special Trip Service (Provided with special telephone)
  - Take all calls about field and special trips from school area offices, principals, and others
  - Communicate requests to bus operations specialists and dispatchers
  - Confirm and follow up requests
  - Note: All requests would come through this unit
- Regular Education Transportation
  - Deal with day-to-day operations problems of regular education buses and drivers
  - Make minor modifications in routes and schedules as needed
  - Confer with Planning Unit on long range routing and scheduling
- Special Education Transportation (Special education phone)
  - Deal with day-to-day operational problems of all special education buses and special education pupils who ride regular buses
  - Make minor modifications in routes and schedules of special education buses
  - Maintain liaison with Office of Special and Alternative Education
  - Confer with Planning Unit on long range routing and scheduling and with Training Unit on training of drivers and aides

DEPOT STAFF

- Dispatchers
  - Supervise and control at depot all buses, drivers, and aides
  - Coordinate and assign buses and drivers to field and special trips
  - Assign relief drivers and arrange for emergency relief buses and drivers
- Route Supervisors
  - Assistant dispatcher in supervision and control at depot
  - Perform field duties and supervision as assigned by dispatcher
- Relief Drivers
  - Serve as driver substitutes under direction of dispatcher
  - Perform other duties assigned by dispatcher

have: demographic information about pupils, information about new housing and shifts in population, information about road conditions, and so on. If it is determined that principals are the best source of pupil information data, planning unit staff would coordinate the collection of the data. In addition, they would be responsible for investigating and reporting on innovations like computer routing and others that may, in the long run, reduce costs.

Training and Field Service

The present position of vehicle operator instructor should be upgraded to equal that of a present area supervisor (and be retitled appropriately), and the individual should be made the head of an adequately staffed unit. Staff members would be responsible for providing all training offered by the Division of Transportation and for coordinating training in special education.

The vehicle operator instructor is already responsible for reporting and analyzing accident data, serving as chairman of the investigating board, and for conducting post-accident remedial training. However, at present, on-the-scene investigation may be conducted by almost anyone in an area office. Information about accidents is not coordinated with training, and there is no real accident prevention program. Making the training unit responsible for accident investigation and data analysis would assure the continuity now lacking and also relieve the bus operations staff of a chore that interferes with other tasks. Information about the causes or correlates of accidents could be used by the training staff in planning all training, including, of course, post-accident remedial training.

The training staff would also be responsible for the 24-month on-bus supervision of drivers that is required by MSDE but not now carried out. The job could be done easily by two staff members who could devote about 25 percent of their time to it (about two hours a day).[1] Supervision and training would thus be a continuum. Information obtained from on-bus observation could be used to identify training needs. Remedial training could be developed and required for drivers with less than satisfactory supervisory reports.[2]

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[1] Given about 600 drivers every 2 years = 300 per year/2 staff members = 150 drivers per year per staff member. With 185 days per school year, each staff member would have to supervise only 1 driver per day. If the driver were observed on 1 entire morning or afternoon run, it would take 2 hours on the average.

[2] It should be pointed out that the reorganization plan presented by the Transportation Division makes 12 route supervisors responsible for on-bus observation--when and if they have time to do it (see Chapter 12). Even if the job was actually done, it would not be coordinated with training.

It might be mentioned that on-bus supervisors would almost inevitably learn a great deal about the road system, the bus route network, problems of drivers and aides, and so on. This information, regularly reported, could be of value to the entire pupil transportation staff.

Community Relations

Community relations is a constant, time-consuming task that is presently magnified beyond necessity. A parent may call several offices and individuals, some of whom do not have decision-making authority to try to find solutions to problems. Everyone then calls area transportation offices. The problem can be brought under control by establishing a unit that handles all public contact. The unit would be provided with special telephone service, and parents would be given one number to call. Staff members would have the information (see Exhibit 15.4) that would enable them either to make decisions or to arrange for decisions in a reasonable period of time.[3]

Bus Operations Unit

Staff members of the bus operations unit would be responsible only for day-to-day fleet operations. This would include the following:

- Exercising control over buses, drivers, aides, route supervisors, and relief drivers
- Assigning buses and drivers to routes and special trips (in cooperation with the planning unit)
- Assuring that buses adhere to schedules and arrive at their destinations
- Providing emergency services
- Making minor modifications in routes and schedules as needed

To eliminate the present competition between regular and special education for a limited amount of staff time, one group of staff members would be responsible for regular and another for special education. The special education sub-unit would be equipped with a special telephone for contact with principals and other MCPS staff members only (not also from parents, who would contact the community relations unit).

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[3] The Board of Education would have to support the unit by making appropriate regulations and procedures on which decisions can be based. Even without this immediate support, however, the unit could relieve the bus operations staff of the burden of calls from parents.

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The field trip sub-unit would be responsible for arranging all field and special trips or other services like half-day closings. Again the unit would have a special telephone number, and all MCPS staff would call that single number to make arrangements for trips.

The communications service would be responsible for all radio communications and would be equipped with a special telephone line to be used by drivers in emergencies. It is assumed that eventually all buses would be radio equipped and that the communication service would be able to contact drivers, dispatchers, and route supervisors by radio. At that time, the special telephone line would no longer be needed.

Dispatchers

It has been shown that the only way to guarantee constant supervision and control of buses and depot staff is to assign a dispatcher with supervisory rank to each depot. The dispatcher would be responsible for a wide variety of tasks, including the following:

- Checking attendance of drivers, aides, route supervisors, relief drivers, and substitutes
- Checking buses and drivers off of and onto the lot
- Assigning buses and drivers to special trips at the request of the field trip sub-unit
- Assigning relief drivers to open runs and, when necessary, calling in substitutes
- Checking odometers and taking other measures to control personal unauthorized use of buses
- Scheduling buses for maintenance

These and other controls that a well trained dispatcher can exercise could, by themselves, increase the efficiency of operation and, in doing so, probably reduce operating costs.

Route Supervisors

The MORE plan, like the reorganization plan proposed by the Division of Transportation, allows for route supervisors at depots. However, while the division's current plan requires 12 supervisors, the MORE plan would require fewer, because they would be responsible for fewer jobs. The training unit would be responsible for on-bus training, supervision, and accident investigation. The communication service and the dispatcher would be responsible for transmitting messages to drivers. The dispatcher would control and supervise buses, drivers, aides, and other depot staff. Route supervisors would not have to serve as substitute drivers except in unusual circumstances. Senior relief drivers could also assume some supervisory responsibilities. The smaller number of route supervisors would, therefore, be able to serve as assistant dispatchers when necessary and concentrate on specific supervisory responsibilities assigned by the dispatcher or the central bus operations staff.

As was pointed out in Chapter 12, the Transportation Division's plan makes what are essentially higher paid radio drivers responsible for supervising a given number of regular drivers. It is claimed that covert on-the-road supervision would increase safety. The MORE team believe, however, that it is unrealistic to think that a route supervisor in a large yellow school bus can actually perform covert supervision and that this is not an effective way to do road checks. Instead, a very few, perhaps only two supervisors, could be assigned pool cars and do road checks on a random schedule (or random to the drivers). Since different pool cars could be used every day, they would be difficult to detect. And since drivers would not know supervisors' schedules, they would have good reason to believe that a supervisor may be lurking around the next bend in the road.

Relief Drivers

The proposal for a relief driver pool is made in Chapter 10. It is pointed out there that relief drivers, even when serving as substitute drivers, could do many jobs that are not now being done regularly, among them the following:

- Checking safety of bus stops or road conditions
- Taking load counts
- Obtaining information about routes (mileage, efficiency, etc.)
- Checking odometers at depots

Some jobs, like checking odometers, could be assigned by the dispatcher. Others would be assigned by unit heads and scheduled through and by the dispatcher.

Staff at Other Lots

Some buses are now parked on high school parking lots, and it is likely that this will continue to be true for some time in the future. To provide for supervision and control of these buses and their drivers, senior relief drivers or, if necessary, route supervisors could serve as dispatchers at these high school lots. An alternative would be to have drivers report in and out by radio (see later) to an assigned dispatcher, though this is not the same as direct supervision.

MORE Staffing Proposal

Exhibit 15.5 shows that the functional units proposed by the MORE team could be formed by the staff allowed by the FY 1983 budget. On the left of the exhibit are the units and job titles and, in parentheses, the number of staff members that could be assigned to each unit; on the right are the positions and numbers of staff allowed in the FY 1983 budget. Because adoption of the MORE plan would involve upgrading some positions, the positions and ranks are not exactly comparable. For example, route supervisors allowed in the FY 1983 budget do not have rank equal to that of dispatchers in the MORE plan. However, there are 31 positions in both cases.[4]

As has been pointed out repeatedly, pupil transportation is understaffed, and even increased efficiency brought about by specialization cannot entirely compensate for this. Some units would be unable to function as effectively as they should with the number of staff members shown in Exhibit 15.5: community relations, field trip service (under bus operations), regular education operations, and special education transportation. The MORE team therefore recommend that these units or services be staffed as shown in Exhibit 15.6. The reasons for these additions are as follows:

- Community Relations
    - A single specialist could not handle all calls, arrange solutions to all problems, and perform all other duties. In addition, when the specialist took leave, there would be no one to assume full responsibility for the unit. An assistant would be badly needed.
    - The clerk would have responsibility for maintaining reference files, pulling regulations, etc. The equivalent of a switchboard operator, the telephone service clerk, would be needed to answer and transfer calls.
- Field Trip Service
    - One individual cannot handle all requests for service, and there would be no one to assume responsibility when the specialist took leave. An assistant would be needed.
    - Accurate accounting for field trip time and mileage and monitoring changes in costs can save money for MCPS. A clerk would be needed to perform these functions.

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[4] Excluding substitutes in the FY 1983 budget and relief drivers in the MORE plan.

Exhibit 15.5

STAFFING FUNCTIONAL UNITS WITH FY 1983 STAFF

MORE Plan Positions	FY 1983 Staff
PUPIL TRANSPORTATION SUPERVISOR (1)	Supervisor of Bus Operations (1)
Secretary (1)	Area administrative secretary (1)
Payroll accounting clerk (1)	Area administrative secretary (1)
PLANNING AND DATA ANALYSIS UNIT	
Planning supervisor (1)	Area transportation supervisor (1)
Assistant planning supervisor (1)	Assistant transportation supervisor (1)
Planning assistants (2)	Route supervisors (2)
Secretary (1)	Area administrative secretary (1)
TRAINING AND FIELD SERVICE UNIT	
Training supervisor (1)	Vehicle operator instructor (1)
Field supervisors (2)	Area transportation assistants (2)
Field investigators (2)	Route supervisors (2)
COMMUNITY RELATIONS UNIT	
Public contact specialist (1)	Assistant transportation supervisor (1)
Clerk (1)	Area general clerk (1)
BUS OPERATIONS UNIT	
Communications operator (1)	Area general clerk (1)
Field trip specialist (1)	Area general clerk (1)
Regular Education Sub-Unit	
Bus operations specialists (2)	Area transportation supervisors (2)
Assistant operations specialist (1)	Assistant transportation supervisor (1)
Special Education Sub-Unit	
SAE transportation specialist (1)[a]	SAE transportation specialist (1)
Assistant SAE specialist (1)	Assistant SAE specialist (1)
DEPOT STAFF	
Dispatchers (4)	Route supervisors (4)[b]
Route supervisors (4)	Route supervisors (4)
Relief drivers	See Chapter 10. Equivalent already included in substitute budget

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[a] Special and Alternative Transportation Specialist.

[b] The route supervisor positions included in the FY 1983 budget are not equivalent in rank to that of dispatcher. See text for recommendations.

Exhibit 15.6

STAFFING OF SELECTED FUNCTIONAL UNITS

(* indicates additional staff)

COMMUNITY RELATIONS

Community contact specialist (1)

*Assistant community contact specialist (1)

Clerk (1)

*Telephone service clerk (1)

BUS OPERATIONS

Communications operator (1)
Field trip specialist (1)
*Assistant field trip specialist (1)
*Field trip clerk (1)
General Clerk (1)

REGULAR EDUCATION SUB-UNIT

Bus operations specialists (2)
Assistant operations specialist (1)
*Operations assistant (1)

SPECIAL EDUCATION SUB-UNIT

SAE transportation specialist (1)
Assistant SAE specialist (1)
*SAE assistant (1)

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*Additional staff beyond FY 1983 allowance. Total = 6.

- Regular Education

  - An operations assistant would be needed to back up this rather small central unit staff, particularly before improved management and control could reduce operational problems.
  - In addition, the position could be considered a promotional and supervisory training position.

- Special Education

  - Two specialists cannot handle all special education operations and also attend CARD and other meetings. An assistant would be needed.

It should be noted that only six new positions are advocated, a 19 percent increase over the administrative, supervisory, and clerical staff of 31 allowed by the FY 1983 budget. However, given the staffing proposed here, all units should be able to function efficiently for a long time in the future and exercise far greater control over operations and costs than the present staff is capable of doing. It might also be mentioned yet again that the pupil transportation staff is only about 83 percent as large as it was in FY 1975, despite the fact that there are now more buses, drivers, aides, and services to be managed. Increasing the staff by 19 percent would therefore merely represent restoration of the 15 percent by which the staff has been cut over the years and a real increase of only 4 percent. This is hardly unreasonable, and even with the proposed increase, the pupil transportation staff, who manage more than 600 buses and drivers, would be only slightly larger than the county Ride-On staff, who manage only 90 buses at peak load.

Salary Costs and Payback

The Department of Personnel Services would have to establish appropriate grades for the positions recommended in the MORE reorganization proposal. It is therefore not possible to say what exact costs would be. However, the MORE staff estimate that annual salary costs for the MORE plan would be between $150,000 and $170,000 greater than the amount already budgeted (FY 1983) to implement the Transportation Division's plan. In Chapter 13, it was shown that reducing mileage on each bus run by only .91 of a mile by more efficient planning would reduce operating and maintenance costs by more than $300,000 a year. This alone would not only pay the annual cost of reorganization, but would yield a net saving to MCPS of $130,000 to $150,000 a year. Additional savings could be expected as a result of increased control that could be exercised by dispatchers, supervisors, and managers.

Start-up Staffing

It is well known that the cost of starting up an operation is always greater than subsequent costs. The same thing is true of the number of staff members. More staff are needed initially than are needed later to keep an operation running smoothly. Therefore, if the MORE plan were adopted, the pupil transportation staff would have to be augmented by temporary staff members, probably for the entire first year of reorganization.

While functional units would be set up as recommended, some would not have much impact on fleet operations for as much as year. For example, it would probably take the planning unit that long to develop a useful information and data base and to begin systemwide planning. Therefore, bus operations during that time would not be much different than at present, and both the regular and special education sub-units might need more staff than proposed in Exhibit 15.5 and 15.6. So also might other units like community relations and services like payroll. The MORE staff believe that the pupil transportation staff, on the basis of their experience with present conditions of operation, should determine the numbers and assignments of temporary staff members needed to carry them out through the start-up year.

In Chapter 10 it was shown that calling in, assigning, and accounting for substitutes is a major time-consuming chore. It could continue to be a serious problem during the period of reorganization, because it is doubtful that the relief driver pool could be created within the first year. Therefore, during the set-up period, the Transportation Division should be authorized to hire a sufficient number of substitutes who would report to work every day (without being called in), be assigned a four-hour daily schedule, and be paid out of the existing substitute account.

Staff Development

In Chapter 13 it was pointed out that the pupil transportation staff have inherited certain attitudes towards and ways of managing the transportation system. They have learned to respond to demands, not to control the conditions of operation. Because they have had to respond, they have learned to solve problems in what might be very costly ways. Furthermore, a feeling of resignation apparently prevails among the staff. Many staff members expressed to the MORE team the belief that their problems are not understood by upper-echelon administrators or by the Board of Education and that, in any case, they will not receive the support of the Board (financial, enforcement of regulations, etc.). Some expressed the fear that if they were to ask for major improvements, they would not get even the very little they have requested in the FY 1983 budget.

In addition, some staff members have not been adequately prepared to do the jobs for which they are actually responsible or, if adequately prepared initially, have received no continuing in-service or other training. For example, it has been general practice to promote bus drivers to the transportation assistant positions. If transportation assistants actually functioned as field supervisors (as in the job description), experienced bus drivers might be considered adequately prepared for the job, provided they were given in-service supervisory training. However, as was shown in Chapter 12, transportation assistants have to perform a wide variety of jobs in area offices: managing field trips, community relations, etc. Experience as a bus driver is probably not adequate preparation for performing these or other supervisory or managerial jobs in area offices or the central office. Transportation supervisors, on the other hand, must have college degrees and training to qualify for the positions. However, after they have been hired (or promoted), MCPS offers them few opportunities to increase their knowledge and skills.

In view of these considerations, it is not surprising that in many meetings and interviews the MORE team discovered that some pupil transportation staff members find it difficult to conceive of managing transportation in new or better ways. Some, for example, seem to have little knowledge of what information might be useful for planning or how to use information if it were available. Very few have any idea of what information or data are already available from the central computer, what useful reports could be generated, or what the best and most useful format of reports should be. In general, staff seem to have little real knowledge of the technological innovations that have already been introduced elsewhere in MCPS (word processors, mini-computers, etc.), of what electronic devices can and cannot do, or of how they might benefit pupil transportation.

Obviously, MCPS has an investment in the present administrative and supervisory staff of pupil transportation. Many of them have considerable knowledge of schools, housing, roads, regulations, laws, etc. in Montgomery County. However, they need to be taught how to administer, supervise, and plan in new and different ways to eliminate problems and reduce costs. It would therefore be essential, during the first year or two of reorganization, for MCPS to invest in a major staff development program, conducted under the aegis of the Department of Staff Development.[5] The following should be included:

- Planning routes and schedules to reduce operating problems and costs
- Obtaining, managing, and using data for route and schedule planning
- Principles of electronic data and word processing
- Principles and methods of direct supervision and remote supervision (i.e., under conditions when the supervisor cannot always be in direct contact with workers)

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[5] Whether or not the MORE proposal is adopted, such a program is needed if transportation is to be properly managed and if costs are to be reduced.

Additional topics would also have to be identified by the division staff in cooperation with the Department of Staff Development. Some of the necessary training can probably be provided by MCPS staff, though consultants may have to be brought in to deal with special topics like route planning.

Training would probably not provide for all needs. In some cases, members of the pupil transportation staff should have to apply for positions in the new organization and compete with other applicants from within and outside MCPS. The position of supervisor of pupil transportation, for example, should be filled by an individual who has had experience in managing a transportation system and who already has training in planning, managing data, and electronic data processing. The head of the training and field service unit would be responsible for planning and coordinating all training and should therefore have both academic credentials and experience in program planning, training, driver education, classroom management, and supervision of educational or training programs. The four dispatcher positions should be filled by experienced dispatchers capable of managing and supervising large numbers of vehicles and drivers and of dealing with complex schedules and assignments.

The director of the division and his administrative supervisors might, of course, determine that some other positions should be filled by open competition. It should be mentioned that MCPS has followed the procedure of filling key positions by reapplication and open competition in previous administrative reorganizations.

MORE Proposal: Facilities And Supports

Building or Offices

The MORE plan would necessitate relocation of the pupil transportation staff from the area offices to a central office. The central office staff could operate from virtually anywhere in the county, though perhaps most efficiently from the Rockville-Gaithersburg area. It is doubtful that the staff could be housed in the present central office at Shady Grove Road, because there is little or no room for more offices. In fact, the overall purpose of the new organization might be best served by moving the entire central office to a new location.[6] For many reasons, one of the closed schools would be an excellent choice for a pupil transportation office.[7]

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[6] Proposals which have been made for the Division of Maintenance could require additional offices at Shady Grove Road; space would be available if the Division of Transportation central office were moved.

[7] The training unit would need classrooms. The planning unit would need rather large workrooms in which to hang large maps, etc.

Depots

A dispatcher would need an office. Route supervisors and relief drivers would need shelter while waiting for assignments. It should also be mentioned here that supervising auto mechanics reported that drivers are sometimes a nuisance in automotive shops (see Part III). At present, there is no place for drivers to wait while service tickets are being written and no place for them to take shelter or have coffee except in the common room used by mechanics as a lunch room. But they must go someplace, and the parking lot is not a suitable place for shelter on a cold winter day. Under the circumstances, it would be desirable to provide both offices and waiting rooms at the depots. Trailers or, still better, temporary buildings would be quite satisfactory.

Telephones and Radios

As has been described, some units would have to have special telephone lines. The bus operations unit would need a radio, and dispatchers should also have radios. There is already radio equipment at each of the three area offices, so only a small amount of additional equipment would have to be purchased.

Eventually, all buses should be equipped with radios to enable drivers to make emergency calls directly to dispatchers. This would solve the problem now faced by drivers, who can neither leave the bus nor send a pupil to make an emergency telephone call. It would also eliminate the present problems caused by second- or thirdhand relaying of information to the garage staff. On-bus radio would also permit the dispatcher or the central operator to relay messages to drivers (changes in routes, etc.). Route supervisors would then no longer have to do this chore by driving a bus to a school as is done now.

Transportation supervisors say it would not be a good idea to equip buses with radios because there would be too much on-the-air chatter among drivers. This, however, is a matter of discipline, and since the central radio would be monitored constantly, it should be possible to enforce the rule that drivers are to use the radio for emergency calls only.

The cost of equipping buses with radios is a more important consideration than radio discipline. The supervisor of automotive maintenance estimated that the cost would be about $1,200 per bus or more than $700,000 for the fleet. Under present economic conditions, this would be prohibitive. However, actual costs may not be that high. It is possible to buy a reasonably good two-way radio for between $300 and $500, and the unit price would be lower for bulk purchases. Furthermore, all buses in the fleet would not have to be equipped with radios in one fiscal year. Instead, costs could be spread out over a 5-year period or longer.

Computer Support

The pupil transportation staff should undoubtedly have computer and word processor support—eventually. It could, for example, be visualized that the much needed student data could flow directly from the main computer to word processors in the pupil transportation office and that the word processors could produce lists of pupils by route, geographic area, etc. However, as has been shown, the necessary information and data are either not now available or are not reliable. Furthermore, as was said earlier, most members of the pupil transportation staff know very little about the kind of information they need, how to use information for planning, and the potential use of electronic data and word processing equipment in managing transportation. Therefore, the planning and data analysis unit would have to work closely during the first year of reorganization with the Department of Management Information and Computer Services to determine their needs and how those needs can be met. At the same time, most of the members of the central office staff of pupil transportation should be given basic training in electronic data processing and its applications.

Discussion

Provided that the Board of Education gave full support by implementing other recommendations included in this report, the MORE team believe that the adoption of their plan and staffing recommendations would vastly increase the efficiency of the pupil transportation staff and make it possible for them to plan, manage, supervise, and control the operation. The MORE routing study demonstrated that using pupils' addresses as the basis for planning bus stops and routes, concentrating on reducing mileage, and enforcing already existing MCPS regulations can substantially reduce pupil transportation costs. So also should greater control of buses, better driver training, and all of the other improvements the MORE plan would make possible. However, there can be no absolute guarantee, especially in the first year or two, that the adoption of the plan would automatically lead to a reduction in costs, because it cannot be known what additional demands will be made on the Transportation Division in the future.

What can be guaranteed is that there is little hope that transportation costs will ever be reduced if the status quo is maintained. The pupil transportation staff have been working on a treadmill for years, unable to get off and unable to change direction. Under adverse circumstances, they have done an excellent job, a job that is appreciated by the users of the services they provide. But as was said in Chapter 5, they have done so at great human cost and probably at too great a financial cost. They must be given the opportunity to reduce these costs. The MORE plan would provide that opportunity.

Recommendation

- The MORE plan for centralizing and reorganizing pupil transportation and for increasing the pupil transportation staff should be adopted and implemented.

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PART III

AUTOMOTIVE SERVICES

CHAPTER 16

DESCRIPTION OF SERVICES

Introduction

Because the functions of the Transportation Division's automotive services section are not as obvious or as well understood as those of pupil transportation, it is appropriate to begin this part of the report with descriptions of those functions, the most important of which are listed in Exhibit 16.1.[1] A description of the organization of automotive services has been given in Chapter 2. To recapitulate briefly, there are four large automotive parking lots and repair depots: Shady Grove, Randolph, Bethesda, and Clarksburg. Depot supervisors and mechanics are responsible for the maintenance and repair of vehicles assigned to their parking lots and for providing emergency road service in their geographic (not school administrative) areas. The Shady Grove depot is also responsible for ordering and distributing parts, supplies, and equipment, and for certain major jobs that cannot be done at area depots.

Preventive Maintenance: School Buses

Because the school bus fleet represents the greatest number of vehicles owned and operated by MCPS, preventive maintenance of the buses is a major job of the automotive services staff. To keep the buses running and reduce the number of operating problems and repairs, the Transportation Division has established its own preventive maintenance procedure and schedule. In addition, the state's Motor Vehicle Administration (MVA) sets preventive

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[1] "Automotive services" is used as a convenience throughout Part III, though with some justification. Automotive services has a mid-level manager in the Transportation Division's central office (supervisor of automotive maintenance) and operates as a kind of sub-unit or section.

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Exhibit 16.1

FUNCTIONS OF AUTOMOTIVE SERVICES

- Provides preventive maintenance and repair of the pupil transportation bus fleet and of all vehicles owned by MCPS (Maintenance Division, Supply Division, Food Services Division)
- Provides emergency road service for the school bus fleet and all other MCPS vehicles
- Purchases and stores fuel (gasoline, diesel) for all MCPS vehicles and distributes (pumps) fuel to MCPS vehicles, driver education cars, and some county vehicles
- Provides maintenance, repair, and operating cost data to MCPS units that own and operate vehicles (including for driver education cars, which are not owned by MCPS)
- Maintains a large parts inventory at the Shady Grove depot for all MCPS vehicles, distributes parts to automotive depots, and maintains small inventory at depots
- Operates MCPS motor pool and staff car system[a]

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[a] The motor pool and staff cars are not discussed in this report but will be dealt with in a future MORE report as a financial, not an operational matter, not an operational one.

Exhibit 16.2

Division of Transportation
MONTGOMERY COUNTY PUBLIC SCHOOLS
Rockville, Maryland

30 DAY INSPECTION (SERVICING)

Date In ____________________

Date Out ____________________

Vehicle Number ____________________

Mileage ____________________

Work Performed By ____________________

____

____

VEHICLE ON LIFT –– All adjustments should be made according to the manufacturer's recommendations. ________

BRAKES –– Adjust ________

CLUTCH –– Check linkage, adjust if required ________

HYDROVAC –– Inspect for leaks ________

HYDRAULIC BRAKE LINES –– Inspect for leaks ________

MUFFLER –– Inspect tail pipe and hangers ________

SPRINGS –– (front and rear) –– Inspect U bolts ________

TIRES –– Check for incorrect wear, air pressure ________

POWER STEERING –– Inspect lines near pump and cylinder ________

ENGINE –– Inspect for oil or water leaks ________

DRIVE LINE –– Inspect ________

TIE ROD ENDS –– Inspect ________

GREASE AND CHANGE OIL MONTHLY –– Change oil filter every other month ________

CHECK AUTOMATIC TRANSMISSION OIL FOR DISCOLORATION AND CHECK FOR PROPER OIL LEVEL ________

(AIR BRAKE EQUIPPED VEHICLES)

Inspect air lines, chambers, hoses for air leaks ________

Inspect air tangs and automatic drain valve ________

(VEHICLE ON SHOP FLOOR)

Battery –– Check water, clean and tighten terminals ________

Belts –– Inspect and tighten ________

Alternator –– Inspect and tighten mounts ________

Carburetor –– Clean air cleaner ________

Fuel Filter –– Clean or replace ________

Anti-freeze –– Check ________

Oil Feed and return lines –– Check ________

Carburetor and gas lines –– Check for leaks ________

Brake pedal –– Check free travel ________

Radiator –– Heater –– Check for leaks ________

(AIR BRAKE EQUIPPED VEHICLES)

Check and tighten air compressor mounting bolts ________

Check operation –– fill alcohol evaporator ________

MCPS Form 215-23, April 1975

maintenance standards for school buses, and MSDE has written MVA standards into its own regulations.

Monthly Service

Once a month, every school bus is inspected and serviced according to standards established by the Transportation Division (Exhibit 16.2). The driver to whom a bus is assigned is personally responsible for making an appointment for service each month. A driver who has not made or kept an appointment is notified and required to bring the bus into the shop.

Annual Preventive Maintenance Check

MVA requires that each bus be given an annual preventive maintenance check. Minimum requirements are shown in Exhibit 16.3. The automotive services staff are responsible for carrying out the check and doing any work that might be required. The Transportation Division sends to MVA a form certifying that the check has been completed. Automotive services staff set up a schedule for the annual preventive maintenance check and tell drivers when to bring buses to the shop.

Formal State Inspection

Three times a year, each bus undergoes inspections administered jointly by MVA and the Transportation Division. Each of the inspections of the entire fleet is carried out within about a two-week period, making it a very busy time for all of the automotive services staff. Exhibit 16.4 shows inspection standards. If a bus fails inspection, defects must be corrected by the automotive services staff. In recent years, the staff have been conducting pre-inspection checks to keep the failure rate to a minimum.

Preventive Maintenance: Other Vehicles

There are no MCPS, MVA, or MSDE requirements or standards for preventive maintenance of the vehicles of the Maintenance, Supply, or Food Services Divisions. The supervisor of automotive maintenance reports that every effort is made to give each vehicle at least one thorough maintenance check per year, and depot supervisors report that they schedule vehicles other than buses for regular lubrication and oil change.

Exhibit 16.3

MVA MINIMUM REQUIREMENTS FOR ANNUAL PREVENTIVE MAINTENANCE OF SCHOOL BUSES[a]

- Brake Drums: Check for cracks, mechanical damage, manufacturer's specifications
- Brake Linings: Reline if less than 1/16 inch (bonded), if less than 1/32 inch at any rivet head (riveted)
- Drag Link-Tie Rods-All other steering linkage: No excessive play
- Exhaust System: Replace if system is patched or leaks
- Brake System: Check hoses and tubes for leaks, cracks, improper support
- King Pins-Ball Joints: Replace if measurement is found to be in excess of (specified diameters)
- Master Cylinders: Check for leaks, fluid level must be at least 1/2 full
- Parking Brake: Must have more than 1/3 reserve, must hold vehicle on any grade
- Service Brake: Pedal travel must not be less than 1/3 total available
- Springs, Shackles, Shocks: Replace broken or worn parts
- Tires: Must have minimum tread of 4/32" front, 2/32" rear, no cuts, no cord showing, no mismatched tires
- Wheel Bearings: Check for improper adjustment and damage
- Wheel Cylinders: No wheel cylinder leaks
- Wheel Seals: Rear wheel seals must not leak

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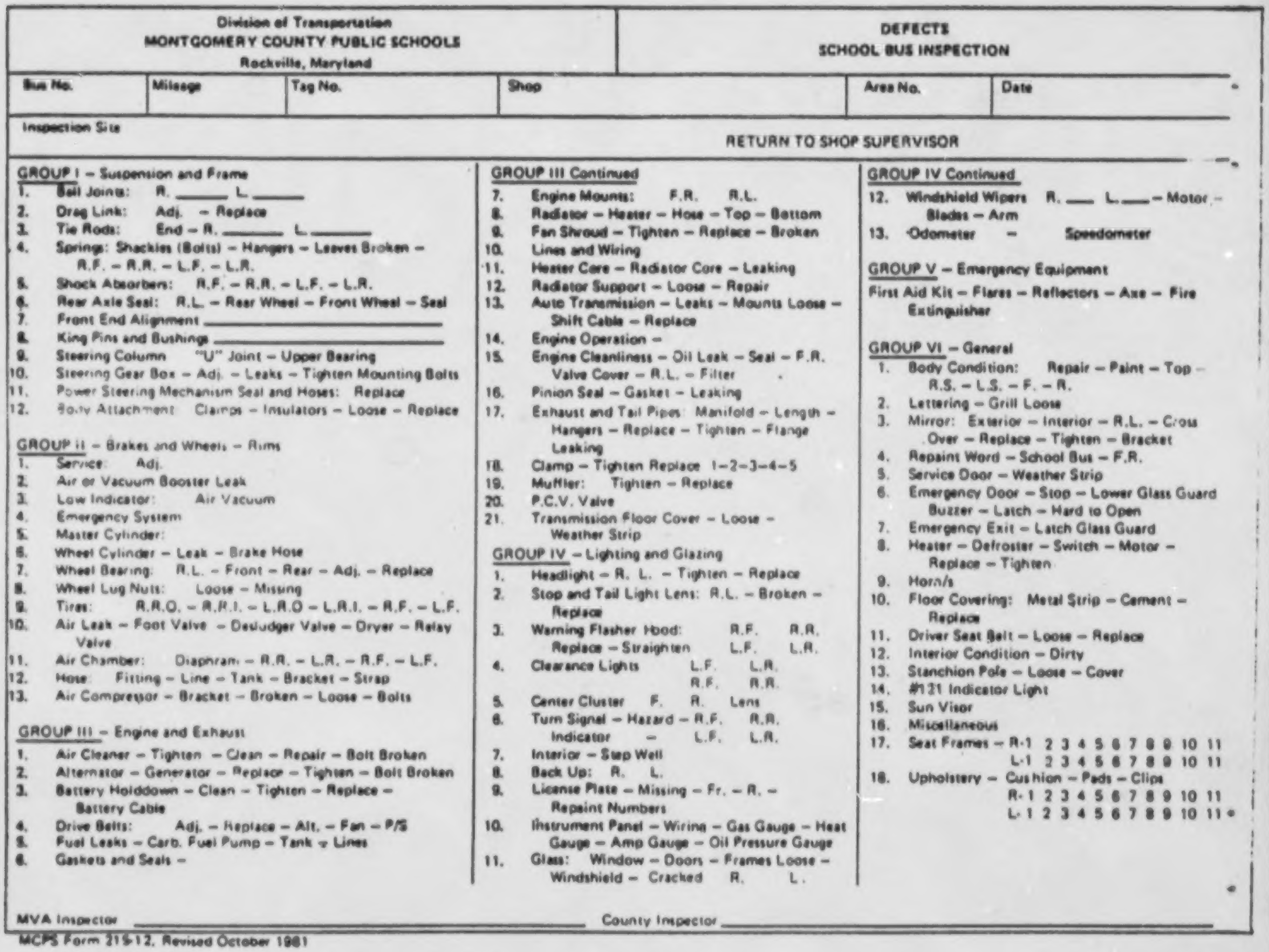
[a] From MVA vehicle preventive maintenance inspection certification form, DL129 (9-79).

Exhibit 16.4

STATE INSPECTION STANDARDS



Division of Transportation
MONTGOMERY COUNTY PUBLIC SCHOOLS
Rockville, Maryland

DEFECTS
SCHOOL BUS INSPECTION

Bus No.	Mileage	Tag No.	Shop	Area No.	Date

Inspection Site

RETURN TO SHOP SUPERVISOR

GROUP I – Suspension and Frame
1. Ball Joints: R. ______ L. ______
2. Drag Link: Adj. – Replace
3. Tie Rods: End – R. ______ L. ______
4. Springs: Shackles (Bolts) – Hangers – Leaves Broken – R.F. – R.R. – L.F. – L.R.
5. Shock Absorbers: R.F. – R.R. – L.F. – L.R.
6. Rear Axle Seal: R.L. – Rear Wheel – Front Wheel – Seal
7. Front End Alignment ______
8. King Pins and Bushings ______
9. Steering Column "U" Joint – Upper Bearing
10. Steering Gear Box – Adj. – Leaks – Tighten Mounting Bolts
11. Power Steering Mechanism Seal and Hoses: Replace
12. Body Attachment Clamps – Insulators – Loose – Replace

GROUP II – Brakes and Wheels – Rims
1. Service: Adj.
2. Air or Vacuum Booster Leak
3. Low Indicator: Air Vacuum
4. Emergency System
5. Master Cylinder:
6. Wheel Cylinder – Leak – Brake Hose
7. Wheel Bearing: R.L. – Front – Rear – Adj. – Replace
8. Wheel Lug Nuts: Loose – Missing
9. Tires: R.R.O. – R.R.I. – L.R.O – L.R.I. – R.F. – L.F.
10. Air Leak – Foot Valve – Desludger Valve – Dryer – Relay Valve
11. Air Chamber: Diaphram – R.R. – L.R. – R.F. – L.F.
12. Hose: Fitting – Line – Tank – Bracket – Strap
13. Air Compressor – Bracket – Broken – Loose – Bolts

GROUP III – Engine and Exhaust
1. Air Cleaner – Tighten – Clean – Repair – Bolt Broken
2. Alternator – Generator – Replace – Tighten – Bolt Broken
3. Battery Holddown – Clean – Tighten – Replace – Battery Cable
4. Drive Belts: Adj. – Replace – Alt. – Fan – P/S
5. Fuel Leaks – Carb. Fuel Pump – Tank – Lines
6. Gaskets and Seals –

GROUP III Continued
7. Engine Mounts: F.R. R.L.
8. Radiator – Heater – Hose – Top – Bottom
9. Fan Shroud – Tighten – Replace – Broken
10. Lines and Wiring
11. Heater Core – Radiator Core – Leaking
12. Radiator Support – Loose – Repair
13. Auto Transmission – Leaks – Mounts Loose – Shift Cable – Replace
14. Engine Operation –
15. Engine Cleanliness – Oil Leak – Seal – F.R. Valve Cover – R.L. – Filter
16. Pinion Seal – Gasket – Leaking
17. Exhaust and Tail Pipes: Manifold – Length – Hangers – Replace – Tighten – Flange Leaking
18. Clamp – Tighten Replace 1–2–3–4–5
19. Muffler: Tighten – Replace
20. P.C.V. Valve
21. Transmission Floor Cover – Loose – Weather Strip

GROUP IV – Lighting and Glazing
1. Headlight – R. L. – Tighten – Replace
2. Stop and Tail Light Lens: R.L. – Broken – Replace
3. Warning Flasher Hood: R.F. R.R. Replace – Straighten L.F. L.R.
4. Clearance Lights L.F. L.R. R.F. R.R.
5. Center Cluster F. R. Lens
6. Turn Signal – Hazard – R.F. R.R. Indicator – L.F. L.R.
7. Interior – Step Well
8. Back Up: R. L.
9. License Plate – Missing – Fr. – R. – Repaint Numbers
10. Instrument Panel – Wiring – Gas Gauge – Heat Gauge – Amp Gauge – Oil Pressure Gauge
11. Glass: Window – Doors – Frames Loose – Windshield – Cracked R. L.

GROUP IV Continued
12. Windshield Wipers R. ___ L. ___ – Motor – Blades – Arm
13. Odometer – Speedometer

GROUP V – Emergency Equipment

First Aid Kit – Flares – Reflectors – Axe – Fire Extinguisher

GROUP VI – General
1. Body Condition: Repair – Paint – Top – R.S. – L.S. – F. – R.
2. Lettering – Grill Loose
3. Mirror: Exterior – Interior – R.L. – Cross Over – Replace – Tighten – Bracket
4. Repaint Word – School Bus – F.R.
5. Service Door – Weather Strip
6. Emergency Door – Stop – Lower Glass Guard Buzzer – Latch – Hard to Open
7. Emergency Exit – Latch Glass Guard
8. Heater – Defroster – Switch – Motor – Replace – Tighten
9. Horn/s
10. Floor Covering: Metal Strip – Cement – Replace
11. Driver Seat Belt – Loose – Replace
12. Interior Condition – Dirty
13. Stanchion Pole – Loose – Cover
14. #121 Indicator Light
15. Sun Visor
16. Miscellaneous
17. Seat Frames – R-1 2 3 4 5 6 7 8 9 10 11
    L-1 2 3 4 5 6 7 8 9 10 11
18. Upholstery – Cushion – Pads – Clips
    R-1 2 3 4 5 6 7 8 9 10 11
    L-1 2 3 4 5 6 7 8 9 10 11

MVA Inspector ______ County Inspector ______

MCPS Form 215-12, Revised October 1981

Repair Service

Automotive services staff perform repairs of almost all kinds on the vehicles owned and operated by MCPS.[2] Most repairs can be done at any of the depots, just as most repairs on private automobiles can be done at a small neighborhood garage. However, some jobs require special or heavy equipment which would, under normal circumstances, be used infrequently at any single depot. Therefore, large or highly specialized repairs are done at the Shady Grove shop, which has the necessary equipment. Preventive maintenance and repair of school buses always have priority, but work on school buses is generally done by the day shift, while work on other vehicles is done by the night shift.

Emergency Road Service

Each depot, except Clarksburg, has a tow truck and a road-service vehicle. Towing or mechanical service is provided to all MCPS vehicles that experience problems on the road. Emergency service is provided by the depot nearest to the scene of a breakdown or accident. The Shady Grove depot handles road emergencies in the Clarksburg service area, and the Bethesda depot handles road calls for any MCPS vehicles that happen to be in the District of Columbia (e.g., buses taking pupils on field trips).

Motor Fuel Service

The Montgomery County government procures motor fuel for all county agencies. The contractor delivers gasoline and diesel fuel to users. The Transportation Division is responsible for maintaining bulk storage tanks and pumps and for pumping the fuel, i.e., for operating service stations. There are storage tanks and pumps at the automotive depots, Lincoln Center, and, to serve driver education cars, at high school lots. While automotive service workers sometimes pump fuel, bus drivers and drivers of other vehicles also fill their own tanks. Depot pumps are linked to a computer, the GasBoy system, which is in the Transportation Division's central office. The person who pumps fuel enters the vehicle's number and current odometer reading into the system at the pump, and this information and the amount of fuel delivered are recorded and printed out at the division's central office by the computer.

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[2] Exceptions are highly specialized repairs, especially repairs of the components of some very large vehicles.

Maintenance, Repair, And Cost Data

Every time an automotive mechanic or automotive service worker does a job, no matter how small, a repair order (better known as an RO) must be filled out. The form is quite large and is therefore not included as an exhibit here. However, it is like the forms used in most large private automotive repair shops and with which most car owners are familiar. At the beginning of a job, the depot supervisor issues an RO to the mechanic who is to do the work. A description of each job, the time it took to complete the job, the parts used and their identification numbers, and the quantitities of supplies are entered onto the RO, which becomes a complete data and cost-accounting record of each job. Every RO has a preprinted control number, and every MCPS vehicle has an identification number, which is entered onto an RO at the beginning of a job. Thus, the data on RO's are always linked to particular vehicles and to the units to which the vehicles are assigned.

RO's are sent from the depots to the Transportation Division's central office, where the account clerk, using a remote terminal, enters the data from each RO into the MCPS central computer. (A copy of each RO is returned to the depot, where a maintenance file is kept for each vehicle.) In addition, though the flow is not direct from one system to the other, fuel and mileage data for each bus are taken from GasBoy and entered into the central computer. At any given time, then, there is a central record of fuel consumption, maintenance, repairs, labor time, labor costs, parts, cost of parts, etc., for every MCPS vehicle. A number of reports are generated from these data: weekly transportation reports, monthly transportation reports, monthly cost summaries, and so on. The Transportation Division is responsible for providing the Maintenance, Supply, and Food Services Divisions with these reports.

Parts And Equipment

MCPS owns and operates more than 1,000 motor vehicles of a wide variety of type, model, size, age, manufacturer, etc. To maintain and repair them, the Transportation Division must order, maintain, and account for a large and complex stock of parts and supplies. The central automotive services staff at Shady Grove is responsible for ordering, receiving, distributing, and accounting for parts, supplies, and equipment. Parts and supplies are sent from Shady Grove to other transportation depots, each of which has its own small parts department.

Technological Planning

Just as the pupil transportation staff are responsible for keeping abreast of technological development like computer routing, the automotive services staff are responsible for keeping abreast of changes in automotive technology. For example, though the diesel engine is by no means a new development, interest in diesel-powered school buses has grown enormously in recent years because of the fuel efficiency of the diesel. Automotive services staff investigated the use of diesel and arranged for the trial of one diesel bus in normal MCPS service. As a result, MCPS will soon have 89 diesel buses in its fleet. This and other technological innovations promise to save MCPS money by reducing vehicle operating costs; and, indeed, technological planning is the major way in which the automotive services staff can contribute to reducing operating costs in transportation, maintenance, and other school services.

CHAPTER 17

SERVICES AND THE BUDGET

Major Trends

Some General Trends

Exhibit 17.1 shows some major trends in services and staffing between FY 1975 and FY 1981. (See also Chapter 2 for additional trend data.) The numbers of school buses and miles travelled by buses and the numbers of Maintenance Division and Supply Division (including Food Services) vehicles have increased since FY 1975. The number of maintenance and mechanical staff members in the Transportation Division has also increased, but by a greater percentage than the increases in numbers of vehicles or school bus mileage.

Costs

Exhibit 17.2 shows major trends in operating and maintenance costs by division for the same FY 1975 to FY 1981 period, giving actual costs, costs adjusted for inflation by the CPI (1975 is base year), and percentage of change.[1] It must be understood that differences among divisions in percentages of change reflect differences in vehicle types, mileage, and other variables that affect costs, not differences in management or staff efficiency. For example, for school buses, the percentage of increase in the cost of gas, oil, and tires was 277 percent, while for Maintenance Division trucks, the increase was 245 percent. But the school bus fleet has grown more than the Maintenance Division fleet, and more pupil transportation services are offered now than in FY 1975.

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[1] Data are broken down by division only because this is the way costs are reported on various computer printouts. Averaging costs would distort the data because there are great differences in numbers and types of vehicles used in the different divisions.

Exhibit 17.1

MAJOR TRENDS IN SERVICE AND STAFF

	FY 1975	FY 1981	Percentage Change
Number of school buses on routes	526	602	14
Number of miles travelled by school buses in millions	7.95	9.82	24
Number of Maintenance Division vehicles	260	262	1
Number of Supply Division (and Food Service) Vehicles[a]	25	32	28
Transportation Division[b] maintenance and mechanical staff	49	71	45

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[a] Food Services vehicles have been accounted for in the past as Supply Division vehicles.

[b] Not including administrative, supervisory, and technical staff, the number of which, for the Transportation Division, was decreased by 87 percent during the same period.

Exhibit 17.2

TRENDS IN MAJOR OPERATIONAL AND MAINTENANCE COSTS: FY 1975 - FY 1981

(Costs in $1,000)

		FY 1981		Percentage Change[a]	
	FY 1975	Actual	Adjusted[b]	Actual	Adjusted[b]
Transportation Division (School Buses)[c]					
Gas, oil, tires	714	2,691	1,632	277	128
Parts	336	778	472	132	40
Contract	59	21	13	-64	-78
Labor	276	515	312	86	13
Maintenance Division					
Gas, oil, tires	95	329	199	245	109
Parts	37	102	62	180	70
Contract	2	7	4	232	101
Labor	42	77	47	84	12
Supply Division[d]					
Gas, oil, tires	38	92	56	139	45
Parts	12	20	12	67	2
Contract	3	0.7	0.4	-80	-88
Labor	10	14	8	36	-18

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[a] Percentage change from FY 1975 - FY 1981; percentages are based on original data, not on the rounded data given here.

[b] Adjusted for inflation by the CPI, using FY 1975 as the base year.

[c] School buses only; Transportation Division trucks not included.

[d] Food Services Division vehicles have, in the past, been accounted for as Supply Division vehicles, and costs cannot be separated out.

As might be expected, the cost of gas, oil, and tires increased more than any other cost in either actual or adjusted dollars. The cost of parts also increased rather dramatically in actual dollars, though when adjusted for inflation, far less than the adjusted cost of petroleum products and tires.

Contract costs for the maintenance of school buses and Supply Division (and Food Services) vehicles decreased substantially because the automotive services staff, in recent years, have obtained training and equipment to enable them to perform work that was previously contracted. In the Maintenance Division, contract costs have increased by 232 percent (101 percent adjusted), primarily because the division operates large trash compactors and some other special vehicles that are maintained by contract.

As was said earlier, the percentage of increase in the number of maintenance and mechanical staff in the Transportation Division has been much greater than percentages of increase in the number of school buses, bus mileage, and in the number of other vehicles (Exhibit 17.1). However, Exhibit 17.2 shows that of the costs that increased, labor increased least of all, especially when adjusted for inflation (resulting in an 18 percent decrease in one case).

Budget Planning For School Bus Maintenance And Operating Costs

Because automotive services is included as part of the total Transportation Division budget, everything that is said about budget planning in Chapter 6 is applicable here. The division staff use the data available to them and attempt to prepare a realistic budget. The budget presented for approval is based primarily on past budgets, not on the documented needs of the division, and must conform to spending guidelines that may not always be realistic. In recent years, this has resulted in the division's being forced to underbudget (or apparently overspend) for automotive services.

Figure 17.3 illustrates the situation. In FY 1981, the amount budgeted for maintenance and operation of school buses was $2,258,000, but the amount actually spent was $3,062,060. It is true that actual expenditures for FY 1981 would not have been known at the time the FY 1982 budget was being prepared (data are always two years behind the budget in preparation). However, it was certainly known that actual expenditures have typically exceeded the amounts budgeted. It was also known that more demands for services have been made on the Transportation Division every year since at least FY 1975 and that more buses were to be assigned to school bus routes. For all of the reasons given in Part II, the exact number of additional route buses may not have been known in advance, but funds for the purchase of 11 additional buses were included in the FY 1982 budget. It had to be assumed that these additional buses would, by themselves, increase maintenance and operating costs.

Exhibit 17.3

AN EXAMPLE OF UNDERBUDGETING FOR MAINTENANCE AND OPERATION OF SCHOOL BUSES

Budget Item	Actual Expenditures FY 1981	Budgeted FY 1982	Percentage Difference
Gasoline	$2,015,399	$2,037,578	+ 1
Oil	29,892	32,582	+ 9
Tires and tubes	365,745	236,135	-35
Parts	651,024	693,705	+ 7
Total	$3,062,060[a]	$3,000,000	- 2

School Bus Data	FY 1981	FY 1982	Percentage Increase
Number of school buses on routes	586	602	+ 3
Miles travelled by school buses in millions	9.44	9.82	+ 4

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[a] In FY 1981, gaoline, oil, tires, tubes, and parts were budgeted as one line item described as "Operation of Buses (Gasoline and Oil)". The amount budgeted was $2,258,000, or $804,060 less than was actually spent.

Despite what was or should have been known, according to the division's director, "the budget review process placed a budget limit of $3,000,000 (on gasoline, oil, tires, tubes, and parts)."[2] Thus, in a year that the number of buses on routes increased by 3 percent and the number of miles by 4 percent, the maintenance and operating budget for school buses was decreased by 2 percent, or by $62,060 below actual expenditures for the previous year. It is true that the separate amounts budgeted for gasoline, oil, and parts were greater than the amounts actually spent in FY 1981. However, it would be difficult to argue that they represent realistic increases (especially for gasoline) when the total amount allowed for the maintenance and operation of additional buses was less than the amount spent the year before.

Funding And Reimbursement:
School Buses

Again, what is said in Chapter 3 and Chapter 6 about funding and reimbursement of pupil transportation costs is applicable here and therefore requires only brief review. Before FY 1982, when block funding was started, MSDE funded a sizeable portion of automotive services by providing a mileage allowance for maintenance and operating costs of school buses. If inflation continues at a rate higher than 8 percent per year, MCPS will have to fund increasingly large proportions of future automotive services budgets (see Chapter 3 in particular).

The charges made for field and other special trips include a standard amount for bus maintenance and operating costs. In Chapter 6 it is shown that charges have generally been too low and do not cover actual costs to the Transportation Division or to MCPS. However, after the Board of Education revised field trip rates in FY 1981, MCPS realized a "profit" of $14,398 from the maintenance and operating component of field trip charges made between April and June of 1981. This did not offset a loss of $43,835 in maintenance and operating costs that had been incurred between July 1980 and March 1981 and only modestly reduced the total loss on field trips in FY 1981 (to $91,516 instead of $105,914). It is possible that the "profit" from maintenance and operating costs might continue. But a profit, in this case, is an indication (just as a loss is) that the maintenance and operating component of the field trip charge has not been calculated accurately. Again, the entire issue is discussed and recommendations are made in Chapter 6.

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[2] FY 1983 budget question number 34 and answer.

Budgeting And Accounting For Costs In Other MCPS Units

By any reasonable standard, the automotive services staff provide a systemwide or central maintenance service for all MCPS vehicles. Like other central services (the Supply Division, for example), automotive services budgets for its own operating costs. Other units include vehicle maintenance and operating costs as a line item in their own budgets. Automotive services pumps the gas and performs maintenance work on the vehicles. Thereafter, the Division of Accounting, using data supplied by the Transportation Division, charges operating, maintenance, and repair costs to the appropriate division's operating budget. A budgeting and accounting system of this kind is quite satisfactory, provided that the following conditions are met:

- All actual major costs must be included in charges against the accounts of the users of the service.
- Costs should not be charged to inappropriate state budget categories.
- One user of the service should not absorb costs incurred by other users.
- Users of the service should have a large measure of control over spending and should receive adequate and timely information on which to base spending and budgeting decisions.

At present, these conditions are not being met.

Budgeting and Charging for Service

The categories in which funds are budgeted are mandated by the state. The Supply Division's vehicle costs are assigned to Category 08 and the Maintenance Division's to Category 09. These costs include only gasoline, oil, tires, tubes, and parts used in repairs. Pupil transportation costs are assigned to Category 07, and all Transportation Division funds are budgeted in this category. Like the other divisions, the Transportation Division has a line item in its budget for the maintenance and operation of school buses; and, as in other divisions' budgets, that line item includes only fuel, oil, tires, tubes, and parts. Although the automotive services staff maintain all MCPS vehicles, and not just school buses, their salaries are included in the Transportation Division's budget in Category 07.

As was discussed in Chapter 16, automotive services repair orders give detailed cost information about every job performed by vehicle and divisional assignment of the vehicle; the information is entered into the MCPS central computer. The Division of Accounting uses the data to make charges for operating and maintenance costs to the various divisional accounts. However, labor costs are not included in the charges. This is not, in itself, particularly unusual in MCPS. The Supply Division, for example, does not charge users of the service for the labor costs involved in delivering supplies. However, not charging for the labor of the automotive services staff violates three of the four conditions discussed earlier: major costs are not charged to users, costs are charged to inappropriate state categories, and one user of the service absorbs costs that should be charged to other users.

In automotive services, labor is often the major cost of a maintenance job. For example, a mechanic and an auto service worker may lubricate a Maintenance Division truck, make a preventive maintenance check while the truck is on the lift, adjust the brakes, and tighten the parking brake cable. The cost of the materials (grease) would be only a few pennies, and labor would be the major cost of the job. However, the Maintenance Division would not be charged for this major expense, and the cost of labor would be absorbed by the Transportation Divison. This means that a major cost would be inappropriately charged to state budget Category 07, which is supposed to be used only for pupil transportation. It also means that the Transportation Division, which budgets separately for school bus maintenance and operating costs and is therefore only one more user of automotive services, would be charged for service costs actually incurred by the Maintenance Division.

Control Over Spending

As was said earlier, a user who is charged for a service should have a large measure of control over spending and adequate information on which to base spending decisions. As matters now stand, the automotive services staff have considerable control over the amount other units must spend, while unit managers appear to have little control. The costs of parts, motor oil, grease, and tires are, of course, not determined by automotive services. However, the automotive services staff determine what work needs to be done on vehicles and what parts and materials are used. Decisions about work thus become cost and spending decisions.

According to automotive managers and supervisors, they do not make decisions independently, but confer with managers of other units when major work is needed on a vehicle. They said, for example, that if a Maintenance Division truck needed a new transmission--a very expensive job--the supervisor of automotive maintenance (or his designee) would discuss the situation with the director of the Maintenance Division. The two managers, it was reported, would take into account the costs of the job, how much of its vehicle budget the Maintenance Division had already spent, the age of the truck and its remaining time in service, and other relevant information. The decision to replace or not replace the transmission would then be made by the director of the Maintenance Division, but with the help of and on the advice of the automotive services staff. However, quite in contrast to this report, the managers of the Department of School Facilities and the Division of Maintenance said the following in a meeting with the MORE staff:

- The Maintenance Division does not get a preventive maintenance schedule from automotive services, is not notified when or if a vehicle is actually given service, and has no way to check to find out if work is done.
- When repairs are needed, automotive services does the work without notifying the Maintenance Division.
- The director of the Maintenance Division has no knowledge of what a repair will cost and gets no estimate in advance from automotive services.
- At any given time, the Department of School Facilities and the Division of Maintenance have no exact knowledge of how much of the vehicle budget has been spent on repairs and cannot make a reasonable estimate.

Not all of these problems were reported by the director of the Supply Division in his interview with the MORE staff.[3] However, he did say that the division usually does not know how much of its vehicle maintenance and operating budget has been spent and is "completely at a loss for budgeting". As a result, he said, the division may be underbudgeted because managers cannot determine actual costs and therefore cannot present a good case for adequate funding. Thus while the reports of the two directors may differ in detail, there is agreement that they do not have very much day-to-day control over spending.

It would not be fair to leave the impression that the automotive services staff deliberately withhold information from division directors and managers. Work would grind to a halt if they had to confer with a manager about every oil change, grease job, or brake adjustment. In fact, if they did this, each director would, in effect, have to manage the preventive maintenance and repair of the division's vehicles, and the advantages derived from a central garage service would be negated. Therefore, the automotive services staff must make most decisions about the work to be performed, and conferences with division managers must be restricted to major jobs. Nonetheless, at any given time, users should know how much of their vehicle budget has been encumbered so they can make informed decisions about spending and budgeting.

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[3] The Maintenance Division has more than 250 vehicles assigned to and parked at all transportation depots. The Supply Division has only slightly more than 30 vehicles and a dispatcher who controls vehicle servicing schedules. The service and maintenance problems of the two divisions are therefore quite different.

Exhibit 17.4

SOME TRANSPORTATION REPORTS OF INTEREST TO USERS OF AUTOMOTIVE SERVICES

- Monthly Accounting Gas/Oil Statistics Report

  Quantities and cost of gasoline and oil by operating area[a]

- Monthly Accounting Repair Activity Report

  Cost of parts, tires, MCPS labor, and contract repair by operating area

- Vehicle Repair Cost Summary:

  Month by month, year-to-date listing of costs by type of repair by operating area

- Vehicle Gas/Oil Cost Summary:

  Month-by-month, year-to-date listing of quantities and costs of gas, oil, and transmission fluid by operating area

- Monthly Transportation Exception Report

  Identifies vehicles which exceed certain limits of gasoline, oil, or transmission fluid consumption or which require excessive numbers of adjustments or repairs. Also "flags" vehicles with no record of monthly service

- Year-end Reports

  Detailed vehicle expense report for each vehicle and totaled by operating areas

- TR-4

  Year-end totals of gas, oil, tires, parts, labor, indirect costs, mileage, and cost per mile for each vehicle and by operating area

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[a] Operating area is used in report descriptions to refer to user or vehicle assignment: bus, pool car, supply vehicle, etc.

Timeliness of Information

In Chapter 16 it was pointed out that various reports are produced by the central computer from the cost and other data obtained from repair orders. Some of these reports would provide unit managers with the information they need to make decisions about spending and to exercise some control over costs--provided that the reports were produced and sent to managers within a reasonable time. Brief descriptions of the most useful reports are given in Exhibit 17.4.

Unfortunately, in the past, monthly reports have been run by the Data Processing Division approximately three weeks to a month after the end of the month to which they apply, e.g., the April report would be produced in late May or sometimes early June. Division directors have gotten them perhaps a week or more after that. Sometimes reports have not been produced and sent to users for even longer periods. The director of the Supply Division said, for example, that in the autumn of 1981, his vehicle account had not been "billed" for several months, but that he needed the data because he was in the process of making the budget for the next fiscal year.[4] Apparently, some reports are not sent to users at all. The monthly exception report would be valuable to directors, since it identifies vehicles which consume excessive amounts of fuel or require excessive numbers of adjustments or repairs. However, in interviews, the directors said they were not at all familiar with the exception report and never received it.

There are probably many reasons why these reports are not sent out on time or not produced and distributed at all. In general, managers of the Transportation Division say the division has "low priority" for data processing. The MORE team found, however, that the Division of Data Processing seems to produce reports as soon as all data are received from or entered into the computer by the Transportation Divison. It is probable that the whole system for getting information from repair orders and GasBoy to the central computer and from the central computer to users is far too cumbersome.[5] Whatever the reason, users of automotive services do not receive the information they need on which to base spending and budget decisions in a reasonable time and do not get some information that would enable them to exercise better control over spending (e.g., the vehicle exception report).

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[4] This means that the last complete set of data to which the director had access had to be for the previous fiscal year, or two years removed from the budget he was preparing.

[5] It was reported very recently that an effort has been made to reduce the time it takes to enter data into the system and produce reports. It is said that reports are now received by the 10th of each month.

Discussion

Transportation Division Service

Automotive services must be looked at in two ways: as an integral part of the Transportation Division and as a central MCPS service. Anything that has an impact on pupil transportation affects automotive services in its role as a provider of service for school buses. As the number of pupils transported, buses, and miles travelled by buses have increased over the years, there have been corresponding increases in the number of staff and costs of automotive services. The maintenance and operating costs of school buses can be controlled, then, primarily by controlling the growth and cost of pupil transportation services. This, of course, is one of the most important topics discussed throughout Part II (but see especially Chapter 6), and it is assumed that if recommendations made there for controlling and perhaps eventually reducing pupil transportation costs are adopted, the cost of automotive services would also be reduced. Until those recommendations can be carried out, it is unrealistic to force the Transportation Division to underbudget (or overspend) every year for automotive services in the face of increasing pupil transportation costs simply because the division's budget as a whole has to conform to certain rather arbitrary spending guidelines. It is even more unrealistic to increase the number of pupil transportation services offered (see Part II) and add buses to the fleet while in the same budget cutting the allowance for school bus maintenance and operating costs.

MCPS Central Service

Every central MCPS service absorbs costs that are actually incurred by other units, and therefore costs are, in effect, transferred among state budget categories. In itself, this is not a problem. However, because the cost of labor is often the major cost of vehicle maintenance, not charging users for labor is a questionable management procedure.[6] First of all, failure to budget and charge for this major cost makes it almost impossible to determine the true costs to MCPS of services, functions, or practices. In turn it is also impossible to determine actual spending trends or to identify costs that might be better controlled or reduced. Furthermore, not charging users for the labor involved in vehicle maintenance inflates the apparent cost of pupil transportation and makes the costs of other services like maintenance and supply appear lower than they actually are. Obviously it cannot be proved that this has had an adverse effect on the Transportation Division's or automotive services' budget in the past, but the potential clearly exists. Because the division's budget is artificially inflated, it could, during budget preparation and negotiations, appear to exceed spending guidelines. Cuts might be ordered, and those cuts could be made in the budget of the division's pupil transportation sub-unit. This could easily explain why the pupil transportation supervisory staff has been reduced over the years despite the growth in pupil transportation services. However, cuts could, instead, be made in the automotive services budget, and this could result in serious underbudgeting, as was discussed earlier and illustrated in Exhibit 17.3. There is no good reason why labor costs involved in vehicle maintenance cannot be charged to users of automotive services.

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[6] Charging users for labor would require the modification of some MCPS budgeting procedures so that automotive mechanic positions would not be charged against the budgets of units other than the Transportation Division.

Since some major charges are already being made against their budgets, users of automotive services must have more control over spending and budgeting than they now have and more timely information on which to base decisions. There must, however, be a reasonable balance between the need for efficient operation of automotive services and the need for managers to control spending. The automotive services staff should not have to consult with and get the approval of external managers for every oil change and grease job, though managers should know what first-echelon maintenance is to be performed on their vehicles, when it will be performed, and how much it will cost. The situation could be handled adequately if automotive services provided other units with schedules and standard costs of certain repetitive jobs in advance. Beyond that, some cost limit might be established. Automotive services would not consult with managers on any job costing less than the limit, but would do so if the projected cost were above the limit. The process could be formalized, at least to the extent that autmotive services would supply a cost estimate and the unit manager would approve the work (or not approve, defer it to a future time or budget, etc.). The process need not be cumbersome. Standard charges can be established for all jobs as is done in private industry, so detailed job-by-job computation would not be necessary.[7]

Control over spending, information about spending, and budget preparation are interrelated, and at present, users are not getting adequate information. The average lag of four to six weeks between the end of the month and the time managers get that month's cost data is far too great. At the end of the fiscal year, the lag is even greater, and managers begin to develop the next year's budget before they know what the previous year's actual costs have been. This may result in underbudgeting of vehicle expenses, as suggested by the director of the Supply Division. The problem should not be difficult to solve, however. Automotive services collects an enormous amount of data, and many good and useful reports are already being produced. What is needed is a reduction in the amount of time it takes to enter data from repair orders and GasBoy into the central computer and to get essential information from the central computer into the hands of managers. Apparently an attempt to accomplish this is already under way.

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[7] An additional benefit would be derived from the use of standard charges. At present, a computer program calculates labor costs by matching a mechanic's name and salary with the hours reported. This is an unnecessarily complex way of going about things, especially when labor costs are reported but not charged to users' accounts (i.e., the precision of the information is unrelated to use). Standard charges would simplify a limited chargeback system. See also Part IV, the auditor's report.

Recommendations

- All recommendations made in Part II that have the potential for controlling and perhaps reducing pupil transportation costs should be carried out as a means also of controlling and possibly reducing school bus maintenance and operating costs.

- All units should be charged for all automotive maintenance costs, including the cost of labor, and mechanisms for carrying out this recommendation should be established.

- Until the preceding recommendation is carried out, it should be recognized that automotive services performs a central MCPS function. Therefore, the growth (or decrease) of the automotive services component of the Transportation Division budget should not be determined by general spending guidelines, but at very least by the following:

  - Number of pupil transportation services to be offered in the budget year and all service and cost data (number of buses to be in service, projected number of miles, etc.)

  - Number of vehicles assigned to other MCPS individuals and units

  - Full time equivalent of hours devoted by automotive service mechanics (and other workers) to MCPS vehicles other than school buses, and the cost of labor

- To give unit managers more control over spending and budgeting, a committee or task force should be formed and should consist of a representative from each of the following divisions: Accounting, Food Services, Supply, Maintenance, Data Processing, and Transportation (automotive services). The committee should consider the following and make recommendations to the superintendent and Board of Education:

  - Cost and other data most useful to users of automotive services, and the most useful and comprehensible reporting format

  - When data are needed and for what purpose

- First-echelon and preventive maintenance schedules and standardized costs
- The possible use of standard repair costs
- Reduction of time from collection of data to data processing and sending reports to users

CHAPTER 18

DELIVERY OF SERVICE

Introduction

This chapter deals with preventive maintenance, repair, and emergency services.[1] Most of the discussion will focus on servicing school buses, which represent about 70 percent of the vehicles maintained by the Transportation Division. There are, of course, some problems involved in providing service to the approximately 1,000 vehicles owned by MCPS. However, it was shown in Chapter 4 that the users of automotive services--bus drivers and managers of the Maintenance Division and Supply Division--reported that their vehicles are well maintained and that the automotive services staff generally do good work in reasonable time.

Preventive Maintenance Program: School Buses

The preventive maintenance program for school buses is described in Chapter 16. Each bus is given a monthly safety and service check. Every year, each bus is also given one extensive preventive maintenance check, three pre-state-inspection checks, and three state inspections. Buses are also checked and any needed adjustments or repairs are made throughout the year when drivers bring problems to the attention of automotive supervisors.

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[1] These, of course, are the major services. Depot and shop problems that impinge on the efficient delivery of service are discussed in the next chapter. The gasoline storage and delivery system and controls on fuel and automotive parts are dealt with in Part IV, the auditor's report.

Success of Program

Perhaps the best measure of the success of the preventive maintenance program is the rather detailed information presented in Exhibit 18.1. Bus drivers were asked on a questionnaire to rate the state of repair or adequacy of functioning of 19 major mechanical and safety components of their buses and, when applicable, of 5 components provided on some buses for special education pupils.[2] Exhibit 18.1 gives the components, ratings, percentages of drivers giving each rating, and (below the footnote line) the meanings of ratings.[3]

The vast majority of drivers reported that all components functioned well or were in good repair. Small percentages of drivers (an average of about 16 percent for the 19 major components) said that one component or another worked adequately but needed some adjustment or repair at the time they filled out the questionnaire. This is probably to be expected because at any given time a number of buses would not yet have had their monthly service. Only three functions or components were said to have been in poor repair or operating condition by more than 4 percent of the drivers:[4] windows, windshield wipers, and heaters. This, however, is not necessarily an indication of inadequate maintenance. Anything used by large numbers of pupils (including windows, seats, etc.) is subject to wear and a certain amount of abuse. In contrast, drivers use windshield wipers only occasionally and may not detect or report malfunctions immediately. The automotive services staff are well aware of drivers' complaints about heaters but can probably do very little about the problem.[5] All in all, then, MCPS school buses, as evaluated by the drivers who use them every day, are in very good mechanical condition, with functioning and well-maintained safety equipment.

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[2] Most drivers who responded to the questionnaire did not drive buses that had special education equipment, which is the reason for the large percentages of no response to those five items.

[3] Meanings of ratings were carefully explained on the questionnaire to assure consistency of use and interpretation.

[4] Four percent of the respondents represents a very small and insignificant number of drivers and buses. In addition, some buses were between maintenance checks.

[5] School buses are big and hard to heat. Opening doors to let students get on a bus also lets in cold air. The problem, then, is not primarily a maintenance problem.

Exhibit 18.1

DRIVERS' EVALUATION OF MECHANICAL CONDITION OF SCHOOL BUSES

Bus Component	Percentage of Respondents[a]			
	Good	Fair	Poor	Not Applicable Or No Response
Body (general condition)	81	16	4	0
Window operation	68	23	8	0
Window glass	93	7	0	0
Outside mirrors	79	21	0	0
Outside lights (head, tail, back up)	97	3	0	0
Outside safety signals (stop sign, etc.)	92	6	0	1
Turn signals	94	4	2	0
Windshield (and other) wipers	66	28	6	0
Doors and door mechanisms	76	21	3	0
Engine (general operation)	76	24	0	0
Starting system (starter, battery, etc.)	82	14	3	0
Gauges (gas, odometer, etc.)	81	14	4	0
Automatic transmission or gear shift	82	15	4	0
Steering system (manual or power)	91	8	1	0
Brakes	83	16	0	2
Tires	89	10	0	1
Heater	68	23	9	0
Seats (upholstery and supports)	70	26	4	0
Floor covering	79	16	4	1
Special equipment				
Wheelchair lift	4	4	0	91
Brackets to hold wheelchairs	11	2	0	87
Seat belts	58	5	2	35
Harness	17	2	2	79
Infant/child car seat	4	1	0	95

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[a] Percentages may not always equal exactly 100 percent because of rounding.

Good: Works well, not broken or torn, no repair or replacement needed
Fair: Works, not broken or torn, needs some adjustment or repair
Poor: Does not work at all, broken, torn, or in need of replacement or repair
Not Applicable: Item is not on respondent's bus

The Problem of Tires

Though all of the drivers said that the tires on their buses were fair to good at the time of their evaluation (see Exhibit 18.1), there is some reason to believe that there is a problem. Auto mechanics, auto service workers, and tire repairers were asked on a questionnaire about the adequacy of preventive maintenance schedules for lubrication, oil change, tune up, and tire inspection. Data are shown at the top of Exhibit 18.2. While most of the workers said the schedules for lubrication, oil change, and tune up are "about right," 13 percent said tires are not checked, repaired, or replaced often enough. Of course, this is not conclusive evidence that a problem actually exists. However, tire maintenance, repair, and replacement do present some unusual problems for automotive services. Large bus tires and rims require special handling, and the necessary equipment is at the Shady Grove depot. Two tire repairers, both at Shady Grove, perform all tire work for school buses. This means either that tires must be brought from the other depots to Shady Grove and then returned to the depots or that tire repairers must go out to the depots where they do not have some of the special equipment they need. The system is therefore cumbersome and may result in inadequate checking, repair, or replacement of tires. It might be mentioned here that in the FY 1982 budget the allocation for bus tires and tubes was 35 percent below the amount actually spent in FY 1981. If there is a problem, underbudgeting will exacerbate it (see Chapter 17 for a discussion of underbudgeting).

Scheduling Problems

The success of the preventive maintenance program depends on drivers' getting their buses to the depots for the scheduled service, especially for monthly inspection and service. Managers and supervisors reported that drivers are told about the service schedule in advance and are personally responsible for making monthly appointments for service at the depots. Appointments are made for times when drivers are not scheduled to make runs and, therefore, when buses are supposed to be on depot lots. Drivers who fail to make or keep appointments are somehow notified (see later).

On their questionnaire, drivers were asked if they are actually told about the preventive maintenance schedule and if the Transportation Division adheres to the schedule. The questions and percentages of drivers responding in various ways are shown at the bottom of Exhibit 18.2. As it turned out, some drivers were confused by the way questions were worded (see exhibit footnote c). Nonetheless, the majority of drivers confirmed that they are told about the service schedule and that the Transportation Division sticks to it. While the system seems to work rather well, then, there are two problems: the failure of some drivers to make or keep appointments and how drivers are notified of the fact.

Exhibit 18.2

RESPONSES TO QUESTIONS ABOUT PREVENTIVE MAINTENANCE OF SCHOOL BUSES

Question	Respondents	Response Choice	Percentages[a] Of Respondents
In your opinion, is the following maintenance done by usual schedules done at about the right intervals?	Mechanics Auto service workers Tire repairers[b]		
Lube, oil change, and general check up		Too often	4
		About right	85
		Not often enough	4
Basic tune up (plugs, points, or electronic ignition)		Too often	4
		About right	80
		Not often enough	7
Tire check, repair or replacement		Too often	4
		About right	74
		Not often enough	13
Are you told in advance the service schedule for your bus?	Bus drivers	Yes	74
		No	25[c]
Does the Transportation Division usually stick to the schedule?		Yes	90
		No	0
		No schedule given	10[c]

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[a] Percentages may be more or less than 100 percent because of rounding or no response.

[b] Responses from all three groups of workers were merged for analysis.

[c] The use of the word schedule was confusing to some drivers, who interpreted it to mean the date on which a bus is to be taken to the shop. The drivers make appointments for monthly service and thus determine the "schedule" themselves.

According to the depot supervisors, in any given month only about 3 to 5 percent of the drivers, or between 20 and 30, fail to make or keep appointments. Though the number is small, supervisors said the problem is serious. The air brakes on buses, they said, need to be checked once a month and, on some buses, need to be adjusted at least that often. A missed appointment therefore becomes a safety problem. Sometimes, the failure to keep an appointment is not the fault of the driver. For example, a driver may make an appointment a week in advance, but may be assigned to cover an extra run on the day the bus is to be serviced. Some drivers, however, simply forget about appointments and fail to take buses back to depots as soon as they have finished their runs. This is a more serious matter and reflects the lack of supervisory control over drivers and buses. Since appointments are made for times when drivers are not scheduled to make runs, a bus that is not at the garage at the time of an appointment is somewhere it should not be.

A good system for notifying drivers that they have missed or not made shop appointments has apparently not yet been developed. Before FY 1983, the method was backwards and therefore cumbersome. Depot supervisors prepared lists of the identification numbers of buses that had been serviced that month, and a clerk had to go through these lists of more than 600 buses to detect the missing numbers of the 20 or 30 that had not been serviced. Beginning in FY 1983, the clerk will receive and check the monthly vehicle exception report, which identifies the buses that have not been serviced. This is a step in the right direction. However, as in the past, area transportation supervisors will be given the numbers of these buses and will contact the drivers by mail or telephone. Previously, the process was time consuming, and by the time drivers were notified that they had missed appointments, it was time to make the appointment for the next month. It appears that this will continue to be true.

Repair Service: School Buses

Adjustments and repairs are performed when buses are in the shop for routine maintenance, and thus repair service is simply a part of the entire preventive maintenance program. However, mechanics cannot detect all possible malfunctions in advance. Therefore, adjustments and repairs must also be made when a driver reports a problem or when a bus breaks down on the road, is damaged in an accident, or vandalized. Both drivers and automotive services staff members were asked on their questionnaires some questions about the repair service. The questions and percentages of respondents answering in given ways are shown in Exhibit 18.3

At first glance, it seems rather surprising that 85 percent of the drivers said their buses had to have mechanical repair from the beginning of the school year until the time the questionnaire was administered (a 4 month interval). However, it must be remembered that "repair" is an almost all-inclusive word here and covers anything from a brake adjustment to an engine overhaul. Furthermore, high frequency of adjustment and repair is favorable. In fact, it is the whole point of a preventive maintenance program

Exhibit 18.3

RESPONSES OF DRIVERS AND AUTO SERVICES STAFF[a] TO QUESTIONS ABOUT THE REPAIR SERVICE

BUS DRIVERS

Questions	Response Choices	Percentages Of Respondents
Since the beginning of the school year, has your bus had to have mechanical repair (not accident)?	Yes	85
	No	15
How long does it take for the shop to complete the typical repair?	Within 1 work day	69
	Within 2 work days	18
	Within 3 work days	4
	Longer than 3 days	2
	No experience (no response)	7
In general, is the work done right the first time the bus is taken to the shop?	Yes, always	33
	Usually, sometimes bus must be returned for same problem	54
	No, bus usually returned for same problem	6
	Don't know or can't judge	7
AUTO SERVICES STAFF		
When bus is in shop for routine check, is enough time allowed to identify problems and make all adjustments and repairs so little problems don't become big ones?	Yes, always	28
	Most of time, but not always	50
	Sometimes, but not often	13
	Never	2
	No opinion (or no response)	7
About how long is a bus in the shop for the usual repair job?	1-4 hours	72
	5-8 hours	4
	About 2 work days	2
	More than 2 work days	2
	Can't judge (or no response)	15
How often do you have to correct a problem that was supposed to be corrected before by another worker?	Very often	7
	Often	21
	Only once in a while	50
	Very rarely or never	22

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[a] Includes auto mechanics, auto service workers, and tire repairers taken as a group. All workers are not able to make judgments about repairs, which accounts for large percentages of no responses or no judgment in some questions.

that is aimed at keeping buses running and prolonging their time in service. The overwhelming majority of drivers said that it takes about one day, or at most, two days for the shop to complete a repair. This too is a favorable finding. If a bus is in the shop when its driver is scheduled to make a run, the driver has to be given a "spare" from the reserve fleet. But according to both the drivers and their supervisors, drivers do not like to drive spares, with which they are not familiar. In addition, reserve buses are supposed to be on standby for real emergencies. When repairs on regular buses are made quickly, drivers are kept satisfied and the reserve buses can be used for the purpose intended. In general, drivers reported that repair work is done right the first time a bus is taken to the shop, i.e., 33 percent said this is always true and 54 percent said it is usually true. However, the 54 percent did equivocate, saying that *sometimes* a bus must be returned to shop for the same problem that took it there in the first place (a common complaint of owners of private automobiles), and 6 percent said a bus *usually* has to be returned for the same problem. In all, then, about 60 percent of the drivers agree that work is not always performed correctly the first time a bus goes into the shop—though it may be more accurate to say that problems may not be correctly diagnosed the first time.

During routine maintenance checks, mechanics should be able to identify and correct small problems before they get bigger, and that too is a major reason for a preventive maintenance program. However, only 28 percent of the auto workers said they are always given enough time to identify problems and make all necessary adjustments and repairs. Another 50 percent said they are usually given time. But the fact remains that 65 percent said that they are not always given time to make all needed adjustments and repairs.[6] Most (76 percent) agreed with drivers that the typical repair job takes only about a day; and, also like the drivers, a majority said that anywhere from "once in a while" to often or very often they have to correct a problem that was supposed to be corrected previously by another worker. Again, this does not necessarily mean that the work is done badly or incompetently the first time a bus is brought into the shop. Instead, the problem may result from a number of interrelated conditions, including the following:

- Drivers may not be given enough mechanical training to enable them to identify or correctly describe malfunctions.
- There is no service writer at a depot (except the automotive supervisor, who doubles as service writer).
- Diagnosis is often more an art than a science unless a wide array of test equipment is available to mechanics. Heretofore, automotive services has not had adequate test equipment (see discussion in next chapter).

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[6] See Chapter 19, Staffing and Personnel Issues, for additional discussion. Automotive workes are apparently expected to work on what seems to be a large number of buses each day.

Whatever the reasons, it does look as if there are some problems in a generally good maintenance and repair program. While these problems do not seem to be reflected in the state of repair or the safety of MCPS school buses, they do need to be addressed.

Emergency Service: School Buses

Frequency of Road Calls

Exhibit 18.4 shows the number of emergency calls, or road calls, to which automotive services responded in FY 1981 and the percentages of drivers responding to a questionnaire item about "breakdown" of buses on the road. In the entire year, there were 2,281 calls. Since comparatively few buses are on the road in summer, a simple adjustment was made to obtain a school year number and average (see exhibit footnote a). About 1,900 calls were made during the school year, or about 10 per day, and on any given day about 2 percent of the fleet required some kind of emergency service. At the time questionnaires were distributed to drivers, only four months of the school year had passed. It is therefore somewhat surprising that 47 percent of the drivers said their buses had "broken down" on the road. However, anything at all that, in the opinion of a driver, required road service was included here, no matter how minor.

Automotive Supervisors' Opinions

Because buses are inspected and serviced so frequently, the number of road calls and the apparent frequency of breakdown seems excessive. However, in interviews, automotive supervisors said that all road calls are not actual emergencies and do not necessarily involve mechanical failure. Instead, they reported, the following are responsible for a very large percentage of calls:

- The driver turnover rate is high, and the many new drivers do not have sufficient training or experience in the mechanical operation of buses.
- In particular, drivers are not trained to start buses properly. They often call for road service after a few futile attempts at starting or, far worse, burn out starters and batteries by operating the starter for too long a time.
- Drivers are encouraged by their instructors and by the automotive services staff to be careful to do nothing that will complicate or increase the severity of mechanical problems. Drivers therefore call for road service for even minor malfunctions.

Exhibit 18.4

FREQUENCY OF ROAD CALLS
SCHOOL BUSES

(FY 1981)

Number of Road Calls by Depot

Shady Grove	629
Bethesda	432
Randolph	980
Clarksburg	240
Total	2,281
School Year Average	10.2 per day[a]

Drivers' Reports of "Breakdown"

Questionnaire Item	Response Choice	Percentages Of Drivers
Since the beginning of the current[b] school year, has your bus broken down on the road while you were doing a run?	Yes	47
	No	53

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[a] The school year average is 10/12 of the total number of calls divided by 185 school days, or .83 x 2,281 - 1,893.23/185 = 10.23.

[b] Questionnaires were distributed in January, so only four months of the school year had passed.

The last comment was not intended to be critical.[7] Supervisors said they would far rather send a mechanic out on the road to tighten, tape, or replace a leaking radiator hose than to have a bus driven into the depot with a burned out engine.

Problems Requiring Road Service

To find the most common reasons that emergency service is needed, the MORE team obtained information about the 120 road calls that were made directly to the (old) Area 3 pupil transportation office in FY 1981.[8] It must be understood that the records reflected what drivers reported at the time calls were made. Exhibit 18.5 shows the type of malfunction and the total number of calls by malfunction. It was assumed that weather conditions would affect operation of the buses, so the data were broken down by Maryland's temperature seasons. Therefore, also shown in Exhibit 18.4 are percentages of calls by malfunction and by season (see exhibit footnote a for example).

Apparently drivers were often not able to identify problems, since the category that accounted for the greatest percentage of calls were malfunctions of unknown origin. Starting problems accounted for the next largest percentage (19 percent) of the calls, and cooling system problems for the third highest percentage (13 percent). Other problems accounted for only small numbers and percentages of calls. There was a "seasonal" pattern to calls, but, as it turned out, the pattern is not primarily related to temperature seasons. As can be seen in the totals at the bottom of the exhibit, the greatest percentage (43 percent) of calls was made between September and November. In six of the ten categories of malfunction, between 50 percent and 67 percent of the calls were made in that same period: starting system, cooling system, engine operation, transmission, minor miscellaneous, and interior electrical. In only three categories did 50 percent of the calls occur in the December to February, the cold weather period: brakes, flat tires, and transmission. In short, in this sample, the greatest percentage of calls for all reasons occurred in the first three months of the school year when the weather was mild, not during the winter when the most severe weather and driving conditions occur.

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[7] However, on the questionnaire, drivers were asked how well the following topic was covered in their pre-service training: How to tell that damage could occur if you kept on driving (when something is apparently wrong with the bus). In Chapter 9, it was shown that 22 percent of the drivers said the topic was not well covered, and 14 percent said the topic was not covered at all.

[8] All calls are not made to pupil transportation offices. This sample of 120 calls does not, therefore, represent all road calls made by old Area 3 bus drivers.

Exhibit 18.5

SAMPLE OF 120 ROAD CALLS
BY MONTH IN OLD AREA 3
(FY 1981)

	Number and Percentage by Category[a]							
	Sept-Nov		Dec-Feb		Mar-June			
Malfunction[b]	N	%C	N	%C	N	%C	Sub Total	Percentage of Grand Total
Unknown	11	26	20	48	11	26	42	35
Starting, battery, alternator	15	65	8	35	0	0	23	19
Cooling system and hoses	8	50	6	38	2	13	16	13
Engine operation	7	64	3	27	1	9	11	9
Brakes	4	40	5	50	1	10	10	8
Flat tire	2	33	3	50	1	17	6	5
Transmission	2	50	2	50	0	0	4	3
Steering and front end	0	0	1	33	2	67	3	3
Minor miscellaneous	2	67	1	33	0	0	3	3
Interior electrical (gauges, horn, etc.)	1	50	0	0	1	50	2	2
TOTAL AND PERCENTAGES OF GRAND TOTAL	52	43	49	41	19	16	120	100

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[a] Percentage by category (%C) is the percentage of cases of a particular malfunction that occurred in the season. For example, 65 percent of the cases of starting, battery, and alternator malfunction occurred between September and November.

[b] Malfunction as reported by drivers to area pupil transportation supervisor. See text.

These data strongly support the opinions of the automotive supervisors. The greatest percentage of road calls were made at the beginning of the school year when new drivers' lack of training and experience would have the most pronounced effect. In addition, 65 percent of the starting problems that required road service also occurred at that time, not in the winter; and starting accounted for the highest percentage of calls that could be attributed to a known cause.[9] In fact, the entire pattern evident in Exhibit 18.4 could be explained by inexperience and lack of adequate training of drivers.

Not all of the road emergencies in this sample can be explained in this way, of course. The highest percentage (50 percent) of brake problems occurred in the winter when roads are wet or covered by snow or ice.[10] The greatest percentage of steering and front end problems (67 percent) occurred in the spring after buses had been driven on the potholed roads of winter--but there were only three such problems. These are major exceptions to the overall pattern, and it does seem as if drivers, rather than inadequate maintenance of buses, may be responsible for a large number of road calls.

Communication and Response to Road Calls

The present organization of the Transportation Division badly complicates and sometimes interferes with the efficient delivery of road service to buses. As was discussed at length in Chapter 12, drivers and buses are assigned to both area pupil transportation offices and transportation depots, and drivers and buses from different administrative areas are mixed at depots. Area offices and automotive services depots are linked by two-way radio, but only 18 buses in the fleet are radio equipped. Since drivers cannot contact area offices or depots by radio, they have to call by telephone and sometimes have to ask passersby to make the call for them. The depot nearest to the scene of a "breakdown" is supposed to provide road service. However, the Clarksburg depot does not have a tow truck, though it can send out a mechanic in a car, and upcounty towing service is provided by the Shady Grove depot. The Bethesda depot normally provides road service to any MCPS vehicle that happens to be in the District of Columbia (e.g., a field trip), and therefore its tow truck or service vehicle may be on a long distance call when help is needed nearby.

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[9] It is highly probable that some of the "unknown" and "minor miscellaneous" problems were actually starting problems.

[10] But inexperienced drivers would face these conditions for the first time and may assume incorrectly that brakes are faulty when road conditions increase stopping distance.

There are two major problems in all of this: notifying the depot that road service is needed and giving the depot staff enough information to enable them to determine whether to send a tow truck or a mechanic in a service car. At present, it is Transportation Division policy that a driver should call an area transportation office to report a road emergency. In actual practice, drivers call either an area office or a depot. It is true that area office staff should be informed of a road emergency. However, when the driver calls the area office first (perhaps the only phone call possible), an area office staff member has to call a depot. The information the depot staff get is therefore either second- or thirdhand, depending on whether the driver or a passerby makes the original call. In either case, the depot staff cannot talk to the driver to determine what the problem is or what kind of equipment to send out. If a tow truck is needed, but the depot sends only a mechanic in a service vehicle, time is wasted and the cost of service is increased. If only a mechanic is needed, but a tow truck is sent out, cost of service is also increased. Since depots provide the emergency service, it would seem that interest could be balanced if drivers were instructed to call a depot and the depot staff called the area office.

Despite the problems in communication, the automotive services staff manages to provide road service rather quickly, according to drivers. On their questionnaire, drivers were asked how long it usually takes from the time a call for service is made to either an area office or a depot and the time help arrives at the scene of a breakdown. Responses were as follows:

	Percentages Of Drivers	Cumulative Percent
15 minutes or less	4	4
Between 15 minutes and 1/2 hour	56	60
Between 1/2 and 3/4 of an hour	23	83
Between 3/4 of an hour and 1 hour	8	91
More than 1 hour	7	98
No experience (or no response)	2	100

The cumulative percent column shows that 60 percent of the drivers said help arrives within a half-hour or less, and 80 percent said help arrives within three-quarters of an hour or less. This is very good response time, especially when problems of communication and the traffic conditions prevailing in Montgomery County are taken into account. Of course, a rather small percentage of drivers said that it takes more than an hour before help arrives, but it is obvious from the other responses that this is not typical.

Service To Maintenance Division Trucks

As far as the MORE staff could determine, Maintenance Division vehicles are being serviced regularly, but there is some confusion about the service. It is reported in Chapter 17 that managers of the Maintenance Division said they do not get a preventive maintenance schedule from the Transportation Division, are not notified when or if a vehicle is serviced, and have no way of finding out if work is done. The supervisor of automotive maintenance said that there is no preventive maintenance schedule for any vehicles except buses and that any maintenance they get "is on a catch-as-catch-can basis." Nonetheless, on visits to the depots, the MORE staff found that depot supervisors had schedules for servicing Maintenance Division trucks. The problem, then, is a very slight breakdown in communication, not lack of service. All depot supervisors said that Maintenance Division mechanics did not adhere to schedules. Therefore, the depot staff solve the problem by taking care of the whole process from scheduling (in two cases with the help of Maintenance clerks) to getting the trucks into the shop at times they are not in use.

This does not necessarily mean that the service is equal to that given to school buses, and there is some evidence that service is not provided on an optimal schedule. Auto mechanics, service workers, and tire repairers were asked on their questionnaire to evaluate the preventive maintenance schedule for vehicles other than school buses. The questions and percentages of workers responding in different ways are shown in Exhibit 18.6. While it is true that 50 percent or more of the workers said that schedules are about right, substantial percentages said that lubrication and oil change (24 percent), engine tune up (22 percent), and checking tires (30 percent) are not done often enough.[11] However, while these responses raise some doubts, they are no evidence that service to vehicles other than school buses is inadequate, since *adequacy* of a preventive maintenance program is determined by many variables: manufacturers' specifications and recommended service intervals, type and quality of lubricants, miles logged by individual vehicles, etc.[12]

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[11] Compare to Exhibit 18.2 where it is shown that only very small percentages said that lubrication and oil changes (4 percent), tune-up (7 percent), and tire check (13 percent) are not performed often enough on school buses.

[12] The MORE staff did not have the resources to carry out a study of all of these variables or an analysis of repair orders on Maintenance Division vehicles.

Exhibit 18.6

AUTOMOTIVE SERVICES STAFF'S[a] RESPONSES TO QUESTIONS ABOUT SERVICE TO VEHICLES OTHER THAN SCHOOL BUSES

Questions	Response Choices	Percentages Of Respondents
In your opinion is the following maintenance done by the usual schedules done too often, at about the right intervals, or not often enough?		
Lubrication, oil change, and general check up of vehicles other than school buses	Too often	7
	About right	59
	Not often enough	24
	No opinion (no response)	10
Basic tune up of other vehicles (plugs, points, timing and/or electronic ignition)	Too often	4
	About right	50
	Not often enough	22
	No opinion (no response)	24
Check, repair, or replace tires of other vehicles	Too often	2
	About right	52
	Not often enough	30
	No opinion (no response)	16

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[a] Auto mechanics, auto service workers, and tire repairers taken as a group. Some workers could not have opinions about some of the questions, which accounts for the high percentage of responses in that category.

Discussion

Bus Maintenance Schedule

At first glance, the preventive maintenance schedule for school buses may seem to be excessive. However, the monthly service check is primarily a safety check that provides for frequent adjustments and repairs. Drivers' evaluations of the service and of the condition of their buses attest to the success of the program.

Notifying Drivers of Missed Appointments

Ideally, drivers should be notified that they have not made or have missed appointments in time to get the bus into the shop when service is needed, not the following month. While the "new" system for identifying and notifying negligent drivers has not yet been tested (as of the time this is written), it is difficult to see how it will work better than the previous one. In the past, the monthly exception report on which the new system is based has not been produced until the third week in the new month. Even if it is produced in the first week of the new month (an optimistic estimate), area transportation supervisors would not get the information and could not notify drivers until about the second week. By that time, the missed appointment could not be made up, and it would be time to make another one anyway. The vehicle exception report could probably be produced weekly or every other week of a current month, but it would contain the bus numbers of non-delinquent drivers who have made appointments, but whose buses have not yet been serviced.

Here is yet another case in which assigning a dispatcher to each depot might eliminate a problem entirely, especially since it involves only about 20 to 30 drivers a month. Until that time, however, the Transportation Division should be required to develop a workable system that notifies drivers in time to get their buses into a shop according to schedule, not a month later. It may be a simple matter of posting warnings on the large notice boards at depot entrances--though someone would have to be made responsible for doing so.

Tire Maintenance

A better system or schedule for inspecting, repairing, and replacing tires also seems to be needed. It is not that tire failure is a major problem, as witnessed by the fact that in the sample of road emergencies presented in Exhibit 18.5, only six (5 percent) were attributed to flat tires. However, in Chapter 9 it was shown that the rear-end collision is one of the more common bus accidents. It is possible that inadequately maintained tires could be one of the causes. Whatever the case, tires should be maintained as well as any other component of a school bus. In the immediate future, automotive services managers and supervisors can encourage mechanics and service workers to inspect tires more closely and report problems to depot supervisors. At longer range, a less cumbersome tire maintenance system may have to be developed. This might involve increasing staff and getting additional heavy equipment. It is something that automotive services managers need to investigate.

Bus Repair Service

Like the rest of the preventive maintenance program, the repair service for buses is good, though there are apparently two problems. Automotive services staff said that when a bus is in for one of its many check-ups, they do not always have time to make the adjustments and minor repairs that head off more serious malfunctions. This is, in part, a matter of staffing, which is discussed in Chapter 20. The other problem is misdiagnosis of mechanical problems, which wastes both time and money. This will be dealt with in the next chapter.

Bus Emergency Service

There is good evidence that drivers may not be given adequate training in the mechanical operation of buses and are responsible for many unnecessary road emergency calls (especially starting, and probably problems with cooling system, engine operation, and brakes). Thorough training in mechanic operation of buses must therefore be added to the improved driver training program discussed at length in Chapter 9.

Present Transportation Division policy increases communication problems and apparently wastes time and money. When a road emergency occurs, a driver should first call the nearest depot, not an area transportation office, because it is the depot that will send help. This would enable the depot staff to determine exactly what kind of help is needed. Of course, in some circumstances the depot should immediately inform the appropriate area office by radio: in the case of an accident, for example, or when a bus load of children is stranded on the way to or from school. In other circumstances, the area office would not have to be informed at all.

The whole problem of communication in emergencies points up the need for a dispatcher at each depot as recommended in Chapter 15. A well trained dispatcher would be called in all emergencies and would arrange for the appropriate service. In Chapter 15, it is also recommended that all buses should eventually be equipped with two-way radios, which would eliminate communication problems almost entirely.

Service to Maintenance Division

The interdivisional confusion about the service provided to Maintenance Division trucks should be eliminated. At two depots, Maintenance Division clerks are involved in making schedules, and there is no reason why the division's staff at the other two depots should not be similarly involved. At some risk of creating unnecessary paperwork, the Maintenance Division central office could be provided with copies of the schedules. If the present schedule is inadequate because the automotive services staff is too small, Transportation Division managers should document the case for additional staff and make appropriate budget recommendations.

Recommendations

Informing Drivers of Missed Appointments

- The director of the Transportation Division should be required to develop a more simple, effective, and timely system for identifying drivers who have missed or not made service appointments. The following should be included:
  - When appointments have been made but missed, identification of the negligent driver within the same week or in time to make another appointment in the same month
  - Weekly notification of drivers who have not made appointments up to that time
- The MORE staff's recommendation that the position of dispatcher be created and that a dispatcher be assigned to each depot should be implemented (see Chapter 15 and elsewhere in Part II).

Preventive Maintenance

- Automotive services managers and supervisors should encourage mechanics and auto service workers to inspect tires more closely and to report problems to depot supervisors.

- The director of the Transportation Division should instruct automotive services managers to investigate the following and produce a report in time for the following fiscal year's budget negotiations:

  - The present system for maintaining tires, including storage, inspection, maintenance, and repair or replacement

  - Improvements (if any) needed in the system

  - Budget implications of needed improvements

Bus Repair Service

- Automotive services managers should be directed to determine the number of buses staff must work on per shift, the amount of time allowed to carry out inspection and maintenance, and the number and type of jobs that cannot be done in the time available. If there are staffing implications, a report should be produced in time for the following year's budget review.

- Additional diagnostic and test equipment should be provided for (see following chapter) in future budgets.

Bus Emergency Service

- All buses should eventually be equipped with two-way radios (see Chapter 15).

- Drivers should be instructed to contact a repair depot, not the area pupil transportation office, in a road emergency and the supervising automotive mechanic should be responsible for informing the proper area office.

- In addition to the recommendations for the improvement of driver training that are made in Chapter 9, drivers must receive thorough training in the mechanical operation of buses.

Service to Maintenance Division

- The director of the Transportation Division should determine the adequacy of the preventive maintenance being provided to vehicles other than school buses.

- If vehicles other than buses are not being serviced regularly, the division director should make a report on budget implications if additional staff and equipment are needed to provide adequate maintenance.

CHAPTER 19

DEPOT AND SHOP PROBLEMS

Introduction

Decentralization of the automotive depots was a sound idea (see Chapter 12), but it was not carried out entirely well and, in a sense, has not yet been completed. Some facilities are inadequate, and this either interferes with the delivery of automotive services or increases their cost. It is possible that at the time the decentralization plan was conceived and the facilities were designed, it was not anticipated that the numbers of pupil transportation services, drivers, buses, and automotive services would increase to their present levels. In addition, budget restrictions or cuts have, over the years, also had their impact on depot facilities, equipment, and working conditions.

Parking Lots

Where Buses Are Parked

One of the best reasons for the decentralization of automotive services was to provide parking for school buses, which were formerly parked in a massive traffic jam at the Lincoln Center or anywhere else in the county that space could be found. Now, the majority of buses are parked at the four depots and are generally nearer to the schools they serve. This reduces "deadhead" mileage from depots to the beginning of bus routes and therefore saves fuel. But not all buses are parked on depot lots, and this creates some problems.

According to the supervisors of automotive maintenance, there is not enough parking space at the four depots for all of the 672 buses in the fleet (which includes spare buses). There is presently room for 12 additional buses at the Bethesda depot, and space for 7 more can be created. The Shady Grove depot can also accommodate more buses, and additional parking space can be created. At Randolph and Clarksburg, there is not enough room for all of the buses presently assigned to these depots. Space can be created, but at some cost to MCPS.

At present, 118, or nearly 20 percent of the fleet, are not parked on depot lots. About 24 are parked on the lots of Sherwood and Paint Branch High Schools. The remaining 94 buses are parked at drivers' homes. Some drivers are allowed to park buses at home because they live close to their routes. This reduces "deadhead" mileage from depot to route, saves fuel, and is a convenience to MCPS. However, this is not true in all 94 cases. In 1977, when decentralization was just beginning, there were only two large lots, one at the Lincoln Center and one at the new Randolph depot (others had not yet been built). At that time, a number of drivers were allowed to park buses at home because their homes were nearer to their routes than either of the two depots. As the other depots were built, some of these drivers continued to park their buses at home despite the fact that the newer depots were just as close or closer to their routes than their homes. Now, drivers who originally had what is considered a privilege want to park their buses at their home even though there is no longer any economical justification for their doing so. At the time of this writing, the matter is an MCCSSE issue, and it is obviously not known how it will be resolved.

Control and Maintenance Problems

When buses are not parked on depot lots, the amount of control supervisors have over drivers and buses is reduced. Off-depot parking also encourages or makes it possible for a certain number of drivers to use buses for personal errands. While this practice may not be widespread, the supervisor of automotive maintenance said that some of the take-home buses seem to use excessive amounts of fuel--which negates the intended benefit to MCPS. Finally, when the driver of a take-home bus is absent, the bus is not available at the depot for a substitute. Some substitute drivers refuse to go to a regular driver's home to pick up a bus. This means a substitute has to be given a spare bus that is supposed to be on hand at the depot for emergencies.

Off-depot parking makes it more difficult for the automotive services staff to schedule preventive maintenance. Buses that are parked on depot lots can be taken into the shop whenever they are not in use, and the automotive staff can take advantage of this. When a driver misses an appointment, for example, another bus, perhaps one that is scheduled for service the following day, can be worked on if it is on the depot lot. On snow days, half days, and school holidays (when other MCPS units are open), mechanics can also work on buses parked at the depots. Buses parked off-depot are obviously not so easily accessible.

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[1] That is, at both Bethesda and Shady Grove there is land along fence lines or land which is being used for purposes other than parking that can be made into parking space.

Vandalism and Security

Vandalism may be less of a problem now than it was in the past. Since the first year of decentralization, the costs of repairing damage to buses caused by vandalism have been as follows:[2]

Fiscal Year	Repair Cost
1977	$35,670
1978	32,811
1979	41,656
1980	21,281
1981	17,160

A two year decrease, however, is not necessarily evidence of a trend; and, in any event, $17,160 is equal to $93 a day for every day in the school year (or the salary of one teacher, etc.). Furthermore, serious damage to just one bus at some time in the future--especially damage that caused an accident--could prove very costly. Security of parking lots is therefore a potential, if not an immediate problem.

Depots and the Sherwood High School lot are lighted at night. Except at Clarksburg where there is no night shift (and at Sherwood), mechanics and service workers move vehicles in and out of shops and walk around lots to locate vehicles that are to be serviced. Still, the depot lots are large, and many areas are dark or in deep shadow. Depot supervisors reported that anyone who wanted to vandalize a vehicle could walk onto a lot at night, do the damage, and walk off without being seen.

Lighting and Vehicle Identification

Some mechanics and auto service workers reported that inadequate lighting of depot lots and the way in which some vehicles are identified causes them to waste time (hence money). MCPS vehicles are identified by number, e.g., M-42 might be a Maintenance Division truck. The numbers are used on service schedules to tell mechanics what vehicles are to be worked on. Mechanics said that new, small numbers have been put on Maintenance Division vehicles in inconspicuous places. Workers cannot see the numbers in the dark and waste time wandering around the lots searching for the vehicles they are to work on. They proposed that lighting be improved and that larger numbers should be put on bumpers where they can be seen easily.

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[2] Source: Vehicle Repair Costs Summary Report for each of the years given. Included is the cost of damage caused by pupils while riding the buses, which, of course, is unrelated to where buses are parked.

Additional Parking Lots

For the reasons that have already been discussed, the director of the Transportation Division, in a memorandum to the associate superintendent of Supportive Services (August 12, 1981), recommended that additional parking lots be established. His recommendation included the following points, most of which are paraphrased here:

- Small secure parking lots should be established "in the more remote areas of the county" like Poolesville, Damascus, Sherwood, Burtonsville, etc.
- Each facility would provide parking space for buses and refueling service.
- An auto mechanic and perhaps an auto service worker would be stationed at each facility to provide minor maintenance.
- Each lot would "provide a gathering point for drivers who now never report to work at any MCPS facility until they arrive at a school with pupils on their buses or at the depots to refuel."
- These area lots would reduce transportation costs and provide necessary security for buses.

While the recommendation is worthy of further consideration, a cost and feasibility study had not yet been made at the time of this report.

Depot Buildings

Randolph Garage

In the typical depot, the service bays, which are work stations with vehicle lifts, occupies most of the building space. In interviews, supervisors of the Shady Grove, Clarksburg, and Bethesda depots did not say anything about inadequate work space, and it must therefore be assumed that this is not a problems at these depots. However, it is obvious that the facilities at the Randolph depot are inadequate. The garage is very small and has only three lifts (work stations), despite the fact that the depot staff are responsible for the maintenance of more than 200 school buses. Furthermore, according to the depot supervisor, one of the lifts is not designed to hold even a Maintenance Division truck, to say nothing of being able to support a school bus. Since there are only two truly functional lifts, some mechanical work must be done on the parking lot (in rain, cold, and snow if the work is essential).

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Office and Other Space

The shop office is the only place where a supervisor can talk with drivers about mechanical problems and do all of the clerical work associated with repair orders. However, offices are typically small and cramped. The area around the office is usually crowded by drivers who are lined up to make appointments for service. The only waiting room and place for drivers to take shelter from the weather is the staff lunch room. It is annoying to the depot staff that they do not have a quiet, uncrowded place in which to eat lunch.

Drivers in Shops

It was reported by supervisors and other depot staff that drivers wander in and out of shop at will, posing a nuisance and a danger. While every loss of a tool cannot be blamed on drivers, it was said that drivers "borrow" tools and fail to return them. Drivers get in the way of workers and sometimes engage in dangerous horseplay. It was reported, for example, that a driver accidentally caused a lift to lower, nearly injuring a mechanic. The complaint, again of both supervisors and other staff, was that there are no rules governing the presence or behavior of drivers in shops.

Maintenance Of Shop Equipment

Exhibit 19.1 is a partial list of the shop equipment found at automotive depots. Both the safety of workers and the efficiency of the garage operation hinge on the state of repair and functioning of everything listed in the exhibit. Yet apparently, preventive maintenance and repair of shop equipment were not adequately provided for in the decentralization plan. The following are paraphrased from a memorandum[3] from the director of the Transportation Division to shop supervisors:

- The Maintenance Division is charged with the repair of such things as lifts and doors, but recent budget cuts have curtailed their ability to carry out this responsibility.
- The Maintenance Division has never been staffed to provide a program of inspection and preventive maintenance of automotive shop equipment.

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[3] Memorandum, Dr. Larry Skinner to Shop Supervisors, Shop Equipment Inspection, Preventive Maintenance, and Repair Program, April 14, 1981.

Exhibit 19.1

SHOP EQUIPMENT REQUIRING PREVENTIVE MAINTENANCE AND REPAIR[a]

Major Equipment

- Vehicle lifts
- Overhead doors
- Gas pumps
- Air compressors
- Tire changers
- Steam cleaners
- Bus washes (motors, brushes, etc.)
- Lube and oil dispensers
- Air hoses and reels
- Exhaust systems
- Front end alignment machines

Miscellaneous Equipment

- Jacks
- Parts washers
- Battery chargers
- Brake rivet machines
- Arc welders
- Grinders
- Wheel dollies
- Presses
- Portable compressors and generators
- Gas welders

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[a] Source: Memorandum, Dr. Larry Skinner to Mr. Dewey Chaney, Transportation Shop Equipment Inspection, April 14, 1981

- Literally thousands of dollars are being spent on outside vendors for the repair of shop equipment, an amount that could be reduced by an in-house inspection, maintenance, and repair program.
- Since the Maintenance Division cannot provide the necessary service, Transportation has to carry out its own program. However, while maintenance of shop equipment falls in the "performs related work as required" section of the job description of automotive mechanics, only volunteers are assigned such jobs.
- Thus far, one mechanic has volunteered to provide inspection, preventive maintenance, and repair on shop equipment in the four depots.

This internal and partial solution to a major problem is obviously not a substitute for a comprehensive inspection, maintenance, and repair program.

Inadequate Test Equipment

In the discussion of the repair service in the last chapter, it was shown that mechanical problems are not always solved the first time a vehicle is taken into the shop. It was suggested that incorrect diagnosis (more commonly called "trouble shooting") may be responsible for this situation, because automotive services has not had adequate testing equipment. Mechanics have their own tools, including timing lights, vacuum guages, tachometers, etc., and MCPS provides them a tool allowance. However, depots have not, in the past, been equipped with the larger, more complex, and more precise test equipment characteristically found in large, modern repair shops.[4] In fact, some of the analyzers the depots do have are said to have been acquired secondhand from high school auto shops. Supervising automotive mechanics said that MCPS is paying dearly for this lack of equipment. One of them said that mechanics trouble shoot by experience, not by use of equipment, and that they have to be wrong some of the time.[5] This means that MCPS pays at least twice for some repairs: once for the one based on the incorrect diagnosis and again to correct the real malfunction. Furthermore, it was reported, a mechanic will sometimes replace a whole assembly or system even though only one part may actually be malfunctioning--though the mechanic would not know which part unless he had the proper test equipment.

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[4] The FY 1983 budget provides almost $34,000 for the purchase of shop equipment, twice the amount allowed in FY 1982 and almost three times the amount allowed in FY 1981. It remains to be seen if this amount will offset the effects of previous underbudgeting.

[5] Because, as in medicine, a number of different mechanical malfunctions can produce the same external symptom.

Shop Manuals And Other References

No mechanic can or should be expected to know the precise specifications (point gap, spark plug gap, valve clearance, etc.) for every vehicle in the MCPS fleet.[6] Therefore, up-to-date shop manuals and other references that give specifications should be available at the depots. Automotive workers were asked on their questionnaire to answer questions about the use and availability of references. Exhibit 19.2 shows the results. A large majority (76 percent) said mechanics and other workers use manuals when they have to make precise adjustments. A plurality of workers (46 percent) said, however, that up-to-date manuals covering all makes of vehicles they work on are not available, and 50 percent said that there are not enough of those that are available. There was no agreement about other references (lube charts, etc.), but the pattern of response suggests that they are not generally available. In comments written on the questionnaire, a number of mechanics said that shop manuals for newly purchased vehicles are often not available at all. However, the supervisor of automotive maintenance reported that MCPS specifications require that shop manuals be included in the purchase of new buses and that manuals are delivered.

Parts And Supplies

Distribution System

Parts and supplies for all depots are ordered, received, checked, and distributed by the automotive services' central office staff at Shady Grove.[7] They are delivered to the depots by a so-called parts runner who is dispatched by radio.[8] The parts runner also picks up and delivers parts when they have to be purchased from a local vendor. Each depot has its own

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[6] Many adjustments require measurement to an accuracy of hundredths or thousandths of an inch. Specifications differ by vehicle type, manufacturer, and model year. Shop manuals give specifications and also typically show "exploded" views of mechanical parts.

[7] Only the issues that bear directly on the delivery of service are included here. A discussion of inventory and controls appears in Part IV, the auditor's report.

[8] The position of parts runner, though absolutely essential, is not provided for as a staff position in the budget. See Chapter 20 for discussion.

Exhibit 19.2

AUTOMOTIVE WORKERS' RESPONSES TO QUESTIONS[a] ABOUT THE AVAILABILITY AND USE OF SHOP MANUALS

Questions	Response Choice	Percentage Of Respondents[b]
Do mechanics and other workers use shop manuals, spec sheets, and other guides when they have to make an adjustment that requires precise measurement (points, valve clearance, etc.)?	Yes	76
	No	9
	Can't judge	15
At your depot are there up-to-date shop manuals covering all makes of vehicles you work on?	Yes	37
	No	46
	Can't judge	17
Are there enough shop manuals so that all workers can use them without having to wait for somebody else to finish with one?	Yes	33
	No	50
	Can't judge	17
Besides shop manuals, are other things like manufacturers' guides, spec sheets, and lubrication charts available for your use?	Yes	39
	No	39
	Can't judge	22

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[a] Auto mechanics, auto service workers, and tire repairers taken as a group.

[b] Some categories of workers could not judge the availability of use of manuals and other sources of mechanical information, which accounts for high percentages of inability to judge.

stock room, which is supervised by a parts clerk. A system is therefore in place, but the delivery of parts is a problem which interferes with the delivery of service and wastes automotive workers' time. Automotive supervisors reported that deliveries are not scheduled regularly and that the parts runner may appear at any time during the day, or not appear at all on some days. This, they said, means that the depot parts clerk sometimes has to go to Shady Grove to get parts, a practice which further wastes time, increases costs (fuel), and leaves the stockroom either closed or unsupervised.

Availability of Parts and Supplies

The mechanical staff were asked some questions on their questionnaire about the availability of parts and supplies. Results are shown in Exhibit 19.3. Twenty-six percent said that the parts they need are not available at a depot more than 10 times a week, 48 percent said this is true 6 or more times a week, and 76 percent said it occurs 3 times or more a week. Unlike parts, supplies like oil, grease, solvents, etc., can be used on any vehicle and can be stored in bulk. Fifty percent of the workers said they are never or almost never without supplies, and only 15 percent said they lack supplies 3 times a week or more. When asked how long it takes to get parts or supplies after they have been ordered at the depot, 52 percent of the workers said they get them either one work day or more than one day later. Only 41 percent said they get parts and supplies at the time they are needed.

According to depot supervisor, vehicles have been kept out of service for lack of parts. They cited the following examples:

Part Needed	Time Out Of Service
Tie rod	4 weeks
Bumper	6 weeks
Gas tank	3 months

One of the supervisors said that a bus assigned to his depot needed a motor mount and that the part had been on order for two months. The bus should not have been in service, he said, but had to be kept on the road anyway.

The internal parts distribution system does not account for all delays in getting essential parts to depots. The supervisor of automotive maintenance said that under present economic conditions dealers have apparently reduced their inventories and that it now takes longer than before to get some parts.

Exhibit 19.3

AUTOMOTIVE WORKERS' RESPONSES TO QUESTIONS[a] ABOUT PARTS AND SUPPLIES

Questions	Response Choices	Percentages Of Respondents[b]
How often in the work week do you find that some part(s) you need for a job aren't available at your depot?	Never or almost never	4
	1-2 times a week	15
	3-5 times a week	28
	6-10 times a week	22
	More than 10 times	26
	Can't judge	5
How often in the work week do you find that some supplies (solvent, liquid wrench, etc.) you need for a job aren't available at your depot?	Never or almost never	50
	1-2 times a week	30
	3-5 times a week	4
	6-10 times a week	2
	More than 10 times	9
	Can't judge	5
If your depot parts department doesn't have some part(s) or supplies you need to finish a job, how soon do you usually get what you need after you've told the parts clerk or supervisor?	In less than an hour	2
	Within 1-2 hours	17
	Within 2-3 hours	9
	More than 3 hours, but in same shift	13
	No same shift, but by next shift	26
	More than one work day later	26
	Can't judge	7

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[a] Auto mechanics, auto service workers, and tire repairers taken as a group.

[b] Some categories of workers could not make judgments in all cases.

Rebuilding Parts

Rebuilding parts is a way to save money. Automotive supervisors reported, however, that because there are now so many buses and other vehicles to be maintained, there is insufficient time in which to carry out an extensive parts rebuilding program. They said, at present nearly all rear ends, transmissions, and alternators are being rebuilt. A few starters are also being rebuilt. They said that if there were time, other parts could also be rebuilt at some savings to MCPS.

Discussion

Parking for Buses

The whole issue of parking buses turns out to be more difficult and complex than might be expected. Certainly one problem can be solved easily: the difficulty automotive services staff have locating vehicles on parking lots at night. Vehicle identification numbers can be made of light-reflecting tape or stenciled with reflecting paint. The numbers can be made large enough to see at night and put on both bumpers of vehicles.

Unfortunately, the interrelated problems of inadequate parking space at depots and off-depot parking cannot be solved easily and cheaply. As was said in the introduction to this chapter, decentralization of depots has not yet been completed, or, perhaps more accurately, events have overwhelmed the original plan. About 20 percent of the bus fleet must now be parked off-depot. Because buses are parked off-depot, there are problems of supervisory control over how buses are used and of scheduling maintenance. If the original intent of the decentralization plan (improving parking facililties, reducing mileage, and saving fuel) is to be realized, the situation cannot be allowed to continue. In the near future, parking space can be increased at the two depots where there is room for expansion and where Transportation Division managers believe expansion is economical. Buses that are now parked at drivers' homes without ample and documented financial justification should be parked at depots.[9] Until additional parking facilities are established, there is a need to study the whole issue of parking buses at drivers' homes to ensure that future decisions are fair to all drivers and that they are actually in the financial interest of MCPS.

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[9] The MORE staff cannot become involved in or deal with the personnel and MCCSSE issues of privilege and seniority which may be involved. The problem here is a financial one, and the solution offered is based entirely on financial considerations.

At longer range, the division director's recommendation to establish satellite parking lots in remote areas needs to be studied very carefully. Additional secure parking lots are needed. However, implementing the director's proposal would require additional fuel storage and pumping facilities, fencing, lights, and additional staff (mechanics and auto service workers). Therefore, either the Transportation Division, another MCPS unit (Facilities, Planning, Construction and Capital Projects), or an external contractor should make a thorough study of cost benefits to MCPS.

The lighting and security of present depot lots and, perhaps of the Sherwood lot, are potential, if not immediate problems. However, if satellite parking lots are ever established, especially in remote areas of the county, lighting and security of those lots will also be problems. It would therefore seem prudent for Transportation Division managers and representatives of the School Security Office and the Division of Construction and Capital Projects (and perhaps other units) to study the problem and make recommendations for effective security. It must be remembered here that the safety and security of staff are involved, because during a large part of the school year it is dark when drivers pick up and drop off buses at lots.

Depot Buildings

Garage facilities at the Randolph depot are inadequate for the number of vehicles to be serviced there. One of the lifts borders on being dangerous and is not used. Additional work space and at least one additional lift capable of supporting a school bus are badly needed.

There are no separate facilities at the depots for drivers. In Chapter 15, it was recommended that trailers or temporary buildings should be set up to serve as shelters and waiting rooms. This would probably be cheaper than constructing new buildings. Regardless of what is or is not done about shelter, drivers must be kept out of the shops for their own protection, for the safety of the automotive service staff, and for the good of MCPS. The managers of the Transportation Division should take immediate steps to effect this, though it is possible that the Board of Education may eventually have to enact a safety regulation.

Maintenance of Shop Equipment

The safety of automotive services workers and the efficient delivery of service depend on the adequate maintenance of shop equipment. The director of the Transportation Division is undoubtedly right in saying that money can be saved by a good in-house preventive maintenance program. Allowing a volunteer automotive mechanic to do the job is a stopgap measure, not a program, no matter how competent the mechanic may be. As MCPS divisions are organized, the Maintenance Division should have responsibility for maintaining automotive shops and some shop equipment. However, as the director of the Transportation Division pointed out, the Maintenance Division has never been staffed to provide a full program of inspection and preventive maintenance. Perhaps it should be. But if the Maintenance Division took on the responsibility (assuming adequate funding and staffing), the division would probably have to assign a mechanic almost full time to the automotive depots.[10] The mechanic would therefore be more under the control of automotive services than of the Maintenance Division. Furthermore, a deluge of paper work would be generated because the Maintenance Division mechanic would have to write work orders for all jobs large and small and the work orders would have to be processed. In the long run, there would be far fewer problems if a new and additional full-time position of shop equipment mechanic were provided for in the Transportation Division budget. Of course, the director of the division should be required to provide adequate documentation of costs and potential savings before the position is created.

Test Equipment

The FY 1983 budget provides nearly $35,000 for the purchase of shop equipment. It is possible that the problem of the lack of test equipment will be solved or at least mitigated, and it would therefore be premature to make recommendations here.

Shop Manuals

With hand-held test equipment and a good ear, an experienced mechanic who has worked on the same vehicles for years can do an adequate job without a shop manual. However, there are good reasons for having manuals and other references in automotive shops. As was pointed out earlier, some adjustments require precision of measurement to thousandths of an inch (or in degrees of arc, etc.), and mechanics cannot always be expected to remember these measurements for every vehicle in the MCPS fleet. Specifications may change from one model year to another, and mechanics need to know the specifications for newly purchased vehicles. Manuals are useful in "trouble shooting," since they typically give exploded views of mechanical parts and sometimes have sections on diagnosis. Finally, as will be shown in the next chapter, automotive service workers are given the opportunity to become mechanics. While they are in training, they should be required to consult manuals before being allowed to make delicate adjustments.

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[10] See Exhibit 19.1 for the variety of equipment that has to be inspected, maintained, and repaired.

For these reasons, automotive services managers and supervisors should make an inventory of the present stock of shop manuals and other references. Additional materials should be ordered if necessary, and if funds are not available, they should be provided in future budgets. Shop manuals for new buses are included in bids, but mechanics' responses to questionnaires suggest that a sufficient quantity of manuals may not be ordered or delivered.

Whether mechanics and auto service workers use shop manuals when they should is another question since manuals are of no value if they are not used. The director of the Transportation Division should therefore require the supervisor of automotive maintenance to investigate actual shop practice. If it is found that manuals are not consulted at appropriate times, especially by relatively inexperienced mechanics, policies should be established and enforced.

Parts and Supplies

The distribution of supplies and parts from the Shady Grove depot to the other depots is another uncompleted part of the decentralization plan that interferes with the delivery of service. The position of parts runner should be created and provided for in the budget (see next chapter for discussion). In present circumstances, it probably makes good sense to dispatch the parts runner by radio. However, a more regular and dependable delivery schedule also needs to be developed and implemented. Depot parts clerks should have to go to Shady Grove and get parts and supplies only rarely or, preferably, not at all.[11]

Rebuilding Parts

Even though rebuilding parts is a way to save money, it is somewhat difficult to see how the parts rebuilding program can be expanded without increasing the numbers of mechanics and auto service workers. No data are available at this time to support the belief that hiring additional staff for this reason alone would be justified. At the same time, it is at least possible that it would be cost efficient to create a position for a mechanic whose only responsibility would be rebuilding starters and some other parts that, for the most part, are now being replaced as units instead of being rebuilt. Transportation Division managers need to investigate the situation and provide a cost-benefit analysis for consideration in future budgets.

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[11] Other problems are dealt with in Part IV, the auditor's report.

Recommendations

Parking for Buses

- Automotive service managers, perhaps in cooperation with the Maintenance Division, should, as soon as possible, put identification numbers on the bumpers of Maintenance Division vehicles (and others if necessary) using reflecting material.

- Transportation Division managers should be required to provide the director of the Department of School Services and the associate superintendent for Supportive Services documented financial justification for all present cases in which school buses are parked at drivers' homes.

- Buses now parked at drivers' homes without ample documented financial justification should be parked at depots.

- Managers of the Transportation Division should be required to develop policies and procedures governing parking of buses at drivers' homes. The following should be included:

  - Mileage data to be used to document and justify decisions and sources of data

  - Who will be responsible for making decisions and who will review decisions

  - Whether or not other considerations that do not involve economic benefit to MCPS are to be involved in decisions (privilege, seniority, etc.) and, if other considerations are to be involved, what measures are to be taken to ensure fairness to all drivers

- The recommendation to establish satellite parking lots for school buses should be studied by a task force made up of representatives from the Transportation Division, Facilities Planning, Construction and Capital Projects, and other units that can make a contribution. A recommendation should be made to the associate superintendent for Supportive Services.

- The same task force should include a study of lighting and security of present parking lots and the security arrangments that would be needed at satellite lots.

Depot Buildings

- o Additional work space at the Randolph depot and at least one additional lift capable of supporting a school bus should be planned and provided for.
- o The recommendation made in Chapter 15 for providing shelter and waiting room for drivers at depots should be carried out.
- o The Transportation Division should make and enforce policies and penalties to keep drivers from entering automotive shops. The associate superintendent for Supportive Services should establish a time limit within which these policies are to be developed.

Rebuilding Parts

- o The director of the Transportation Division should study the issue of rebuilding parts and submit a report to the associate superintendent for Supportive Services. The following should be included:
  - . Identification of parts which are not now being rebuilt or being rebuilt in limited numbers, but which would be practical to rebuild if there were adequate staff
  - . Annual cost of replacing units instead of rebuilding
  - . All rebuilding costs (including salaries, fringe benefits, etc.) if work were done by the automotive services staff
  - . Budget implications: staffing, potential savings (if any), etc.

Maintenance of Shop Equipment

- o The director of the Transportation Division should study and report on the cost of carrying out a preventive maintenance program for shop equipment under each of the following conditions:
  - . Performed entirely by outside contractors
  - . Performed by the Maintenance Division (including resources needed)
  - . Performed by a shop equipment mechanic assigned to the Transportation Division (including salary, tools, and any other resources)

- The above report should be reviewed by the associate superintendent for Supportive Services, and a budget recommendation based on the report should be made.

Shop Manuals

- Automotive services managers and supervisors to make an inventory of the present stock of shop manuals and other references

- If necessary, additional manuals and references should be ordered and/or funds for their purchase should be included in the next budget.

- The supervisor of automotive maintenance should determine if specifications for new buses include a sufficient number of service manuals and, if necessary, include the required number in all future specifications.

Distribution of Parts and Supplies

- The position of parts runner should be created and provided for in future staffing and budgets (see the following chapter).

- The director of the Transportation Division should require automotive services managers to develop and implement the best possible regular delivery schedule of parts and supplies under the present circumstances.

CHAPTER 20

STAFFING AND PERSONNEL ISSUES

Staffing Trends And Present Staffing

Trends

Between FY 1975 and FY 1981, the following changes occurred:

	FY 1975	FY 1981	Percentage Of Change
Number of buses on routes	526	614	+17
Bus miles in millions	7.95	9.82	+24
Number of Supply Division vehicles	25	32	+28
Number of Maintenance Division vehicles	260	262	+ 1
Number of mechanics, auto service workers, and tire repairers (supervisors excluded)	44	63	+43%

At first glance, the increase in the number of workers seems excessive. However, increases in the numbers of vehicles and in the number of miles logged by buses alone increased the need for mechanics and auto service workers. Decentralization of the depots and the creation of night shifts at three of them also increase the need for mechanical staff. And finally, it must be remembered that if the motor pool and staff cars are included, the 63 workers are responsible for a fleet of approximately 1,000 vehicles.

Exhibit 20.1

STAFFING OF AUTOMOTIVE SERVICES SHOP AND DEPOTS
(number of staff in parenthesis)

SHADY GROVE SHOP

Day Shift

Supervising Auto. Mech. (1)
Automotive Mechanic (16)
Tire Repairer (2)
Auto. Service Worker (6)

Night Shift

Lead Auto. Mechanic (1)
Automotive Mechanic (4)
Auto. Service Worker (3)

SHADY GROVE PARTS DEPT.

Day Shift

Auto. Parts Clerk II (1)
Auto. Parts Clerk I (1)
Auto. Service Worker (1)
Office Assistant (1)

Night Shift

Auto. Parts Clerk I (1)

BETHESDA DEPOT

Day Shift

Supervising Auto. Mech.(1)
Automotive Mech. (4)
Auto. Service Worker (4)
Sat. Auto. Parts Clerk (1)

Night Shift

Lead Auto. Mechanic (1)
Automotive Mechanic (2)
Auto. Service Worker (1)

RANDOLPH DEPOT

Day Shift

Supervising Auto. Mech.(1)
Automotive Mech. (3)
Auto. Service Worker (4)
Sat. Auto. Parts Clerk (1)

Night Shift

Lead Auto. Mechanic (1)
Automotive Mechanic (4)
Auto. Service Worker (2)

CLARKSBURG DEPOT

Day Shift (only)

Supervising Auto. Mech. (1)
Automotive Mech. (5)
Auto. Service Worker (3)
Sat. Auto. Parts Clerk (1)

Present Staffing

Exhibit 20.1 shows the FY 1982 staffing of the automotive services shops. Without counting parts department staff, the Shady Grove central shop has three times more workers on the day shift than the outlying depots and about 50 percent of all workers when parts staff are included. There are 10 day shift staff at Bethesda and Clarksburg, but only 9 at Randolph, the depot which has inadequate facilities (see previous chapter). However, the Randolph night shift is second in size only to Shady Grove. It should be noticed that a parts clerk is on duty at Shady Grove on the night shift, but not at the other depots.

Adequacy Of Staffing

Mechanics and Auto Service Workers

With exceptions that will be noted later, managers of automotive services say that the budget allows for enough mechanics and service workers. Apparently, however, there are two problems. In Chapter 18, it was shown that on their questionnaire 65 percent of the workers said that when a vehicle is in the shop, they do not always have time to make all necessary adjustments and repairs. This may be a reflection of an excessively heavy workload, which, in turn, may mean that there are not enough workers. There is also the problem of how staff are distributed by depot and by shift.

On their questionnaires, workers were asked questions about their typical workload. Results are shown in Exhibit 20.2. Forty-six percent of the respondents said they are expected to work on 7 or more vehicles during an 8-hour shift, and 25 percent said they work on more than 10 vehicles per shift. Even at the lower figure, this amounts to an average of about one vehicle per hour. Yet only 15 percent of the workers said they are expected to work on too many vehicles per shift.

The workload is not evenly distributed. At Randolph 75 percent and at Clarksburg 50 percent of the day shift said they work on more than 10 vehicles per shift, or more than one per hour. Only small percentages of the staff at Shady Grove and Bethesda said they work on this many vehicles per shift.

Exhibit 20.2

AUTOMOTIVE SERVICES STAFFS'[a] ESTIMATES OF WORK LOAD

Question	Response Choices	Percentages Of Respondents
About how many different vehicles do you work on during your usual 8-hour shift?	1-2	11
	3-4	17
	5-6	21
	7-8	13
	9-10	9
	More than 10	24
	Can't estimate,no response	5
What is your opinion about the number of vehicles you are expected to work on during your usual 8-hour shift?	Too many	15
	About the right number	72
	Too few, could handle more	4
	Can't judge, no response	9

ESTIMATES OF WORK LOAD BY DEPOT AND SHIFT
(Number of buses worked on per shift)

	Percentages of Respondents					
Shift and Depot	1-2	3-4	5-6	7-8	9-10	More Than 10
DAY SHIFT						
Randolph				25		75
Clarksburg		13	13	25		50
Shady Grove		36	36	7		21
Bethesda	14	14	29		14	14
All depots	3	21	24	12	6	32[c]
NIGHT SHIFT[b]						
Randolph		33			67	
Shady Grove			40	40		
Bethesda	100					
All 4 depots	33	8	17	17	17[c]	

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[a] Mechanics, auto service workers, and tire repairers.

[b] No night shift at Clarksburg.

[c] Row percentages do not equal 100 percent because of rounding and no response.

Furthermore, at Randolph, 67 percent of the night shift staff said they work on between 9 and 10 vehicles per night in contrast to the smaller numbers reported by the majority of workers at Shady Grove and Bethesda.[1]

It is possible, of course, that the ordinary lube job and oil change takes only a short time and that workers can turn out more than one vehicle an hour. However, on paper, at least, the standards for the monthly service check seem rather demanding. Therefore, the data suggest that mechanics and auto service workers may actually be expected to turn out more vehicles per shift than they should and that they do not have time to make all necessary adjustments and repairs. At Randolph, more workers are apparently needed on both shifts, but because there are only two functional work stations (Chapter 19), there is probably no room for them. At Clarksburg, where there is no night shift, workers on the day shift have to maintain both school buses and Maintenance Division vehicles. The supervisor of the depot said he would be willing to take a reduction of workers on the day shift to create a night shift.

Workers on Light Duty

A worker who is injured on the job or who develops a physical condition (not necessarily job related) that, in the opinion of a physician, restricts the kind of work the individual can do, is put on "light duty."[2] The worker continues to fill a budgeted position of mechanic or auto service worker but may not be able to carry out all the jobs a mechanic or service worker is normally expected to do. In fact, managers and supervisors must often assign workers to quite different jobs. Therefore, while managers said enough workers are provided for in the budget, they also said there is always a shortage of workers because, at any given time, a certain number of mechanics or service workers are on light duty. As of July 1981, between 7 and 10 workers, or about 10 percent of the work force, were on light duty, though the number has decreased recently as workers have retired.

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[1] The data by depot and shift must be viewed with extreme caution. The more categories into which data are divided, the greater the percentage accounted for by any one individual within a category. There is therefore considerable exaggeration. It cannot, for example, be assumed that all workers on the night shift at Bethesda work on only one or two vehicles per shift.

[2] Restrictions may include not lifting a weight of more than 20 pounds, not working under vehicles, etc.

Exhibit 20.3

NUMBER OF YEARS OF SERVICE[a]
BY PERCENTAGE OF STAFF AND POSITION

	Percentage of Staff					
Position	Less Than 1 Yr.	1-3 Yrs.	3-5 Yrs	5-8 Yrs.	8-10 Yrs.	10 Yrs. Or More
Tire Repairer	50					50
Auto Service Worker	8	23	8	8	15	39
Auto Mechanic	4	9	35	4	13	35
Lead Automotive Mechanic			50			50
Supervising Auto Repair Mechanic			25			75
All Staff	7	11	26	4	11	41

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[a] Source: Responses to item on questionnaire, and therefore does not include all maintenance and mechanical staff. However, more than 60 percent of all workers returned questionnaires, so results can be generalized to the staff as a whole.

Parts Runner

It was shown in Chapter 19 that the distribution of parts from Shady Grove to depots is a problem. Managers of automotive services have been solving it for themselves by assigning the job of parts runner to an individual who is on light duty. This is a perfectly legitimate assignment, but the parts distribution system should not depend on what is essentially a makeshift arrangement. The need for the position of parts runner should be recognized and the position should be provided for in the budget. As will be shown in Chapter 23, this can be done at lower than present cost.

Turnover And Absenteeism

Turnover

Thus far, turnover has apparently not been a major problem for automotive services. Exhibit 20.3 shows the number of years of service with MCPS of the automotive staff by percentage of staff and position. Forty-one percent of the staff have been employed by the Transportation Division for 10 years or more and 52 percent for 8 years or more. In FY 1981, 3 mechanics and 1 auto service worker left service, and the turnover rate for that year was only 6 percent. It might be noted that two of the three mechanics retired after long service with MCPS.

Absenteeism

Absenteeism is also not a major personnel problem in automotive services, but because of the heavy work load at the depots, it has an impact on the amount of work that does or does not get done. On the average, the rate of absenteeism varies between 10 and 15 percent. This is about what might be expected, given the leave benefits granted by MCPS.

Mechanics, auto service workers, and tire repairers were asked questions about what happens when someone on the same shift who has the same job is absent. Results are shown in Exhibit 20.4. Sixty-one percent of the respondents said they had to do work that would normally be assigned to the absent person. However, 57 percent said they are able to spend as much time on jobs as they should, and 65 percent said jobs are done as well as they should be. According to 41 percent, some work does not get done, which is about what might be expected. This means, of course, that absence can disrupt the extensive and demanding maintenance schedule.

Exhibit 20.4

AUTOMOTIVE SERVICES STAFF'S[a] RESPONSES TO QUESTIONS ABOUT WORK LOAD AND ABSENCE OF WORKERS

Questions	Response Choice	Percentage[b] Of Respondents
DOES THE FOLLOWING HAPPEN WHEN SOMEBODY ON YOUR SHIFT WHO HAS THE SAME JOB AS YOU HAVE IS ABSENT:		
You and/or other workers have to do the work that would normally be assigned to the person who is absent?	Yes	61
	No	26
	Cannot answer or no response	13
You can't spend as much time as you should on each job?	Yes	28
	No	57
	Cannot answer or no response	13
Jobs can't be done as well as they should be?	Yes	22
	No	65
	Cannot answer or no response	13
Some work just doesn't get done?	Yes	41
	No	39
	Cannot answer or no response	13

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[a] Auto mechanics, auto service workers, and tire repairers taken as a group.

[b] In all cases, 13 percent of the respondents said they were the only individual on the shift with a given job classification and therefore could not answer the questions.

Training

Entering Training and Experience

Auto mechanics employed by MCPS must be able to maintain and repair all components of a wide variety of vehicles. To qualify for the position, an individual must have completed a recognized apprenticeship and have journeyman experience as a mechanic. Automotive service workers must be able to assist mechanics in making repairs or adjustments, replace some components (mufflers, etc.) without the direction of a mechanic, lubricate vehicles, make minor emergency repairs, and perform many other jobs around the shop. To qualify for the position, an auto service worker must have experience in servicing and maintaining vehicles, but not have completed an apprenticeship.

MCPS is fortunate in having well-trained, experienced mechanics and automotive service workers. Exhibit 20.5 shows the training and experience mechanics and service workers had at the time they were first hired by the Transportation Division. A third of both groups had an automotive program in high school. Seventy-three percent of the mechanics and almost 40 percent of the service workers had gone through a trade or technical school automotive program. Large percentages (87 percent of mechanics, 72 percent of service workers) had previous on-the-job training at a garage or auto shop. Almost half of the mechanics had training in the repair of large vehicles, and 60 percent had shop experience on large vehicles. While only 28 percent of the service workers had training on large vehicles, almost 40 percent had shop experience on them.

Formal Training Opportunities

According to the managers of the Transportation Division, the automotive services staff are offered the opportunity to obtain formal training. Manufacturers of vehicles or automotive parts and equipment may offer courses at the Shady Grove depot. For example, AC-Delco provided the following training on various dates between December 1980 and June 1981: high energy ignition systems, charging and cranking systems, maintenance free batteries, emissions control systems, computer carburetor systems, and air conditioning systems. All mechanics and service workers were directed to attend these classes. Other classes are offered at manufacturers' training centers. For example, there is a General Motors training center at Fairfax, Virginia to which 29 workers were sent (not all for the same training) between February and March 1981. Courses offered were on carburetors, governors, power steering systems, cranking systems, and light duty diesel engine diagnosis and overhaul. Whether offered at Shady Grove or at training centers, some training is provided free, but some must be paid for. According to the division managers, workers are selected for training by seniority and present

Exhibit 20.5

TRAINING AND EXPERIENCE OF AUTOMOTIVE MECHANICS AND SERVICE WORKERS WHEN FIRST HIRED BY PERCENTAGES OF WORKERS[a]

	Position At Which Hired	
Training or Experience	Mechanic[b]	Service Worker[b]
High school automotive course or program	33	31
Community college automotive course or program	-	7
Trade or technical school automotive course or program	73	38
On-the-job training at a garage or auto shop	87	72
Training in the repair or maintenance of large vehicles (like school buses)	47	28
Shop experience on large vehicles	60	38

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[a] Percentages of mechanics and service workers who responded to these items on questionnaires, and therefore not of total staff. However, more than 60 percent of staff returned questionnaires.

[b] Percentages cannot be added by columns because an individual could respond in more than one category of training and experience.

job assignment, but everyone, they said, gets an equal opportunity to receive training. The courses given at Shady Grove, they said, are open to all workers, further equalizing opportunities.

On their questionnaire, mechanics, service workers, and tire repairers were asked about opportunities for this kind of formal training. Results are shown in Exhibit 20.6. Seventy-eight precent of the workers said they had been offered the chance to take a class or course in the previous year, and 76 percent said they actually took advantage of the opportunity. During their service with MCPS, a large proportion of the workers take a rather large number of courses. By comparing the data in Exhibit 20.6 with the length of service of workers given in 20.3, it can be seen that the typical worker takes at least one course a year. For example, 56 percent of the staff have been employed for 5 years or more, and 58 percent of the respondents said they have taken 4 or more courses since being employed by automotive services. In general, then, worker's reports confirm what is claimed by the division's managers: workers are apparently given a fair opportunity to take formal training. It should be mentioned that the questionnaire data apparently suggested that auto service workers were not being given as many opportunities for training as mechanics. Seventeen percent of all workers said they were not offered a chance to take a class or course of any kind between July 1980 and June 1981. A breakdown of the data showed that this 17 percent included 31 percent of the automotive service workers but only 4 percent of the mechanics who responded to the questionnaire. All of them were wrong. The MORE staff easily obtained copies of memoranda showing that all mechanics and service workers were scheduled (required, in fact) to attend some classes at Shady Grove training center during FY 1981. Their response, however, may suggest that there might have been a breakdown in communication between the central office and depots.

Training opportunities might be limited in the future. Cuts in the division's budget would make it more difficult for managers to find money to send workers out for training. Even if there were no cuts in the budget, the effects of inflation would limit the amount of training that can be purchased with available funds.

On the Job Training

Managers of the division reported that an automotive service worker has the chance to be trained as a mechanic and, eventually, to be promoted to that is put on jobs as a mechanic's helper and, in time, is allowed to do increasingly complex jobs. An individual who can function as a mechanic can be promoted after an "apprenticeship" of four years. Some automotive service workers, it was reported, have a lot of initiative, learn mechanical work (primarily replacing whole units) very quickly, and are ready for promotion in two years. Data obtained from questionnaires show that of 29 respondents who were originally hired as automotive service workers, 16, or 55 percent, now hold the position of auto mechanic, lead auto mechanic, or supervising auto mechanic (see next section on promotion).

Exhibit 20.6

RESPONSES TO QUESTIONS ABOUT IN-SERVICE TRAINING OPPORTUNITIES[a]

Questions	Response Choice	Percentage Of Respondents
Between July 1980 and June 1981, did the Transportation Division offer you a chance to take a class or course of any kind in automotive service, maintenance, repair, or other job-related training?	Yes	78
	No	17
	No response	5
Did you actually take any of the training that was offered between July 1980 and June 1981?	Yes	76
	No, chose not to	2
	No, never offered	17
About how many training courses paid for or offered by the Transportation Division have you taken in the whole time you have worked in the division?	More than 10	17
	9-10	4
	6-8	20
	4-5	17
	2-3	24
	1	4
	No response	1

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[a] Mechanics, auto service workers, and tire repairers taken as a group. Percentages are of the more than 60 percent of all workers who returned questionnaires.

Other Opportunities in MCPS

In-service courses offered by MCPS are open to the automotive services staff, though few of them are of immediate interest to automotive mechanics and service workers. Nonetheless, some mechanics have taken in-service courses in supervision. Mechanics and auto service workers can also take courses at Montgomery College and elsewhere under the tuition reimbursement plan offered by MCPS. During the time of the MORE study, however, only one individual took advantage of this.

Promotion And Position Classes

Promotion

Training, promotion, and the number and type of position classes are closely interrelated. While workers can probably be required to take certain training as a condition of employment, they may not be eager to take advantage of all training opportunities unless training contributes to advancement in salary and position. Even when training is required, workers may reasonably expect they will somehow benefit from acquiring new skills and performing additional or more complex work. But the extent to which workers can advance is determined by the number of promotional opportunities or position classes in their unit.

As matters now stand in automotive service, there is little incentive for workers, especially automotive mechanics, to seek or take additional training--though the quality of the maintenance program depends on their keeping abreast of new developments in their trade. Exhibit 20.7, which compares the entry level and current position of 44 workers, shows the that reason. Automotive service workers have generally fared better than automotive mechanics, primarily because their lower position at entry makes promotion possible. Of the 29 in the sample who started as auto service workers, more than half (56 percent) now occupy higher positions, including positions as lead auto mechanic and supervising auto mechanic. In contrast, 80 percent of those who were hired as automotive mechanics are still automotive mechanics, and only 20 percent advanced to higher positions. To some extent, seniority is involved here, since some of the service workers who have become lead or supervising mechanics have been employed by MCPS for a long time. However, 35 percent of the present auto mechanics have been employed by the Transportation Division for 10 years or more, 48 percent for 8 years or more, and 52 percent for 5 years or longer. At the time they were hired, 73 percent of the mechanics, compared to only 38 percent of the auto service workers, had completed a trade or technical school automotive program (see Exhibit 20.5). And finally, a large percentage of the mechanics have taken many formal courses in maintenace and repair (see Exhibit 20.6), and some have even managed to take in-service training in supervision.

Exhibit 20.7

COMPARISON OF POSITION INTO WHICH HIRED[a] AND POSITION CURRENTLY HELD BY 44 AUTOMOTIVE SERVICES STAFF MEMBERS

Position Into Which Hired		Position Now Held (FY 1981)		
	N		N	Percentage
Automotive Service Worker	29	Tire repairer[b]	1	3
		Automotive service worker	12	41
		Automotive mechanic	11	38
		Lead auto mechanic	2	7
		Supervising auto mechanic	3	10
		Totals	29	99[c]
Automotive Mechanic	15	Automotive mechanic	12	80
		Lead auto mechanic	2	13
		Supervising auto mechanic	1	7
		Totals	15	100

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[a] Source: Questionnaire data broken down by responses to two items. Not all respondents answered both items.

[b] Auto service worker placed in position of tire repairer at own request.

[c] Rounding error.

While auto service workers have gained promotion through on-the-job training, managers reported that there are some impediments to their progress. Apprenticeship status is not recognized, i.e., there is no budgeted position of apprentice mechanic. Therefore, even when performing as a mechanic, the individual is paid as an auto service worker. Furthermore (see earlier), managers said that though some service workers qualify as mechanics after only two years of on-the-job training, the Personnel Department insists they cannot be promoted until they have served out a full four years. The situation may, in part, be created by the Transportation Division. As far as can be determined, there are no policies or standards for determining who is qualified to enter an "apprenticeship," what training must be given, or how and when an individual qualifies as a mechanic.

Mechanics as Supervisors and Specialists

Division managers reported that the present table of organization does not provide for enough supervising mechanics or other higher-level positions. As a consequence, automotive services has again had to make up a deficiency by finding its own solution to what is actually a personnel and budget problem: volunteers perform jobs that are not in their job description, are at a higher level than the one for which they are paid, and have supervisory or similar responsibilities. For example, it was reported that at the Shady Grove shop, one volunteer has taken on the duties of a lead automotive mechanic, which is a working supervisory position. Another acts as a service writer—a job done elsewhere by supervising auto mechanics--and dispatcher of motor pool vehicles. At the depots, on any given shift, there is no so-called second man to serve as supervisor when the supervising auto mechanic (day shift) or the lead auto mechanic (night shift) is on leave or otherwise unable to deal with shop problems. Volunteers now carry out the responsibilities.

The director of the Transportation Division said that at present the work done by these volunteers may be justified under the "other duties as assigned" provision in their job descriptions. However, he said, if they refused to do the jobs, it is highly doubtful that they could be forced to do so because, in all cases, the jobs are at a higher level than the positions they occupy. There is also, then, the problem of what could happen if workers would refuse or simply not volunteer.[3]

Some mechanics also serve as specialists. For example, a mechanic who has taken additional and advanced courses in transmission repair will function as a specialist, repairing transmissions and consulting with other mechanics on transmission problems. Though this undoubtedly saves money for MCPS, the training and semisupervisory responsibilities of the specialists are not recognized or rewarded.

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[3] There is also a potential, though apparently not an immediate association issue, depending on how the situation is handled.

Position Classes

Given all of the circumstances that have been described, managers of the Transportation Division say that there are morale problems. Many workers are effectively "stuck" in their present positions and therefore have little reason to take further training or assume additional responsibilities. In addition, there is a shortage of line supervisors. Therefore, they said that new position classes should be created. For example, the supervisor of automotive maintenance has proposed[4] the following position and grade structure below the supervisory level:

Lead mechanic/Service writer
Mechanic II
Mechanic I
Tire repairer II
Tire repairer I
Apprentice mechanic
Automotive service worker
Parts runner

Other suggestions have also been made by managers and supervisors. It was said that a position called something like "lubrication mechanic" is needed, a position below that of auto service worker. It was also said that gas station attendants should not be classed as automotive service workers, but should have a lower position class and grade.

Discussion

Adequacy of Staffing

While there is some evidence that automotive services may not have enough mechanics and auto service workers, the major problem may be the distribution of staff. Randolph clearly needs more workers on both shifts, but there is probably no room for them. The construction of additional work stations, as recommended in Chapter 19, followed by either the reassignment of staff from other depots to Randolph or the addition of new staff would solve the problem. A night shift is needed at Clarksburg, and the depot supervisor's recommendation that it be created by reassigning day-shift staff should be seriously considered. The position of parts runner is badly needed and should be provided for in the budget (see Chapter 23 for doing so at comparatively low cost).

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[4] Not proposed formally as of the time of this report, but discussed with the MORE staff as one possible solution to the various problems. Parts clerks and central office staff are not included above, though they are part of the supervisor's tentative plan.

It can be a serious problem when as many as 7 to 10 workers (9 to 14 percent of the labor force) cannot perform the jobs they were hired to do because they must be placed on light duty. A large part of the problem is the present inflexible position structure in automotive services. A worker is either a mechanic, a tire repairer, or an auto service worker. There are no lower-level and comparatively undemanding positions in which a worker can be placed when assigned to light duty. For example, while an auto service worker is now acting unofficially as a parts runner, he continues to occupy the position of auto service worker and to be paid accordingly. If the position of parts runner existed (a lower-level position), he could be placed in that job, leaving open an auto service worker position. The MORE proposal for a new position structure, which is discussed in Chapter 23, provides positions to which workers on light duty could be assigned.[5]

Training

Each year there is some change in automotive technology. In, say, the past 10 years or so, generators have been superseded by alternators, electronic ignition systems have become commonplace, maintenance free batteries have come into existence, and so on. In addition, MCPS now seems to be committed to the use of buses powered by diesel engines, which operate quite differently than gasoline engines. Therefore, the continuing training of mechanics and auto service workers is just as important to the vehicle maintenance program as the continuing training of teachers is to the educational program.

There are two separate issues in training: the role of on-the-job training and more formal training in new techniques and technology. On-the-job training is primarily, though perhaps not exclusively, a way to enable tire repairers and automotive service workers to qualify for promotion to the position of mechanic. It is a good idea, and MCPS probably derives benefit from it.[6]

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[5] The issue of whether or not the salary of a worker who is placed on light duty should be red circled if the worker is reassigned goes well beyond the limits of this report.

[6] Better morale, retention of workers, reduction in recruiting efforts and costs, etc.

Formal training in new techniques and technology is more important than on-the-job training in the whole scheme of things, because it is this kind of training that enables workers to maintain new equipment and to use new tools. If budget limitations make it more difficult to send mechanics out for training, an alternative must be found. One possibility would be to enlist the services of MCPS teachers of automotive courses or programs and have them teach mechanics and auto service workers, perhaps during the summer. At the present time, however, there is no evidence that the formal training program is actually endangered.

At present, MCPS in-service training for mechanics and other workers is not really an issue at all. It is highly doubtful that the supervisory courses that are offered are of any real value to them, and other in-service courses are probably of even less interest and value. If it turns out that MCPS must depend on its own resources to provide future formal training in new techniques and technologies, then in-service courses may have to be developed.

Promotion and Position Classes

The current situation in automotive services almost demands the creation of promotional opportunities and new position classes. While auto service workers can look forward to promotion—because they start at the bottom and can move only upward—mechanics have little to look forward to except continued employment in the same job at the same level. This applies equally well to mechanics who have taken no additional training in 10 years and to those who have taken two courses a year for the same period of time. The lack of promotional opportunities therefore adversely affects morale and provides no incentives for self-improvement, even when the improvement is also to the benefit of MCPS. Lack of opportunity could also encourage experienced mechanics, in whom MCPS has an investment, to look elsewhere for employment. Furthermore, there are not enough line supervisors in automotive services, and the gaps are now being filled by volunteers. MCPS has therefore been depending on the good will of the very workers who are denied opportunities for advancement.

Recommendations

Promotional positions and related issues will be discussed and recommendations will be made in Chapter 23.

Staffing

- Additional work stations should be constructed at the Randolph depot (see Chapter 19), and, thereafter, additional mechanics and auto service workers should be provided for in the budget and assigned to that depot or should be reassigned to Randolph from other depots.
- A night shift should be created at the Clarksburg depot by either reassigning present Clarksburg day shift staff or by recruiting volunteers for a night shift from other depots and reassigning some Clarksburg staff as their replacements on day shift.
- The position of parts runner should be created and funded in future budgets (see Chapter 23).

Training

- The director of the Transportation Division should determine as soon as possible what formal training opportunities now exist, whether what exists is adequate to MCPS' needs, and whether or not sufficient funds are available to send workers to formal training courses.
- If opportunities for formal training are found to be decreasing for whatever reason, the director of the Transportation Division should submit to the associate superintendent for Supportive Services a report describing the situation and recommending solutions.

CHAPTER 21

MANAGEMENT AND SUPERVISION

Introduction

Though automotive services is decentralized, the situation is quite different from the one that prevails in pupil transportation. The central office is organized and staffed to manage operations. Workers are assigned to specific depots and, except when a worker goes on a road call, are always in close proximity to a supervisor. There are, however, some minor flaws in an otherwise sound structure.

Present Organization And Supervisor-to-Worker Ratio

Organization

Exhibit 21.1 shows the present managerial-supervisory structure of automotive services. The supervisor of automotive maintenance, acting under the division director, is responsible for the entire garage operation. In theory at least, the supervisor has an assistant, the repair services supervisor, who is responsible for coordinating some central office functions and many operations and for providing technical assistance to the heads of depots. The staff responsible for ordering and distributing parts and supplies are housed at the central office. The parts inventory is computerized, and the automotive services central office has a computer terminal linked directly to the mainframe at the ESC. The gasoline distribution system is independently computerized, and the computer and printer are housed at the division's central office. A senior accounts clerk is responsible for computer operations.

Exhibit 21.1

AUTOMOTIVE SERVICES' MANAGERIAL-SUPERVISORY STRUCTURE

DIVISIONAL CENTRAL OFFICE

Director, Division of Transportation

Supervisor of Automotive Maintenance

Repair Services Supervisor

Parts Department
Inventory
Accounts

DEPOTS

Day Shift	Night Shift[a]
Supervising Auto Mechanic	Lead Auto Mechanic
Auto Mechanics	Auto Mechanics
Auto Service Workers	Auto Service Workers
Tire Repairers[b]	
Parts Clerks	

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[a] No night shift at the Clarksburg depot.

[b] At the Shady Grove shop only.

Automotive depots are geographically decentralized and not associated in any way with school administrative areas. Depots are under the direction of supervising automotive mechanics who report to the supervisor of automotive maintenance. At the depots that have night shifts, a lead auto mechanic serves as a working supervisor but reports to the supervising auto mechanic who is in charge of the depot.

Supervisor-to-Worker Ratio

The supervisor-to-worker ratio in automotive services seems to be satisfactory no matter how it is calculated, though, as will be shown later, this is misleading. Overall, counting lead auto mechanics as working supervisors, there are 9 supervisors and 71 mechanics, auto service workers, tire repairers, parts department workers, and clerical and accounting staff. The ratio is therefore a little more favorable than 1:8, or 1 supervisor for every 8 workers. If lead auto mechanics are counted as workers instead of as supervisors, there are 6 supervisors and 74 workers, or a ratio of about 1:12. Taking only the Bethesda, Randolph, and Clarksburg depots and counting lead auto mechanics as workers, the ratio is 1:11, which would be very good indeed if the supervisors of these depots were actually able to supervise (but see later). At the Shady Grove shop, if the lead auto mechanic is counted as a worker and only one parts department worker is considered to be assigned to the shop on the day shift, the ratio is 1:37, more than three times that at the other depots.[1]

Problems In Management
And Central Office Staff Assignments

Review of Problems

Exhibit 21.2 is a brief review of some of the problems in management that have been discussed in previous chapters or that will be discussed at greater length later in this chapter. Some are minor, like the lack of up-to-date shop manuals. Others, like the inability of depot supervisors to devote

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[1] In a sense, the main parts department at Shady Grove is a part of both the central office and the central shop. Assigning just one parts clerk to the shop for purposes of calculation is therefore conservative.

Exhibit 21.2

REVIEW OF SOME MANAGEMENT PROBLEMS AND CHAPTER IN WHICH DISCUSSED

- The Supply Division and Maintenance Division say they are not always informed in advance of service and the cost of repairs; data reports on costs are not sent to them in a reasonable time (Chapter 17).
- An effective system for notifying drivers of missed maintenance appointments has not been developed (Chapter 18).
- Road emergencies are often caused by bus drivers, and drivers are not given adequate training in the mechanical operation of buses (Chapter 18).
- The parts distribution system is makeshift, and there is no regular, reliable schedule for the parts runner (Chapter 19).
- The division is solving its own problem of maintenance of shop equipment by stopgap measures, and a satisfactory long-range solution has not been proposed (Chapter 19).
- Bus drivers pose a safety hazard in shops, but the division has no policies to control the situation (Chapter 19).
- Depot supervisors are able to spend only 50 percent or less of their time supervising and consulting with workers (this chapter).
- There is minimal control and sometimes no control over parts and supplies at depots (see documentation later in this chapter).

adequate time to supervision, are major problems or can have major consequences. However, the problems have been selected to illustrate the following important points:

- They are primarily matters of lack of control over operations, not of inadequacies in the organizational structure.

- Most can be solved rather easily without the need for additional staff or resources.

- Some can be solved easily if managers take advantage of the fact that automotive services and pupil transportation are parts of the same division.

For example, providing cost information to other divisions requires only that Transportation Division managers meet with managers of those divisions to determine what information they need and when they need it. They might also have to meet with the managers of the Data Processing Division to determine how to expedite the flow of data. Neither action requires additional resources. The lack of an adequate system for informing drivers of missed service appointments, inadequate training of drivers, and the safety hazard that drivers pose in shops are all internal divisional problems and should be easy to solve if managers simply give them the time and attention they deserve.

Some, but only a few of the problems can be solved only if managers of automotive services are given adequate financial support. The lack of a satisfactory and permanent solution to the problem of maintaining shop equipment, for example, is a budgetary matter. As was discussed in Chapter 19, the position of parts runner is badly needed and should be provided for in the budget. As will be shown in Chapter 23, it is probable that money can actually be saved by creating the position.

Recent History of Managerial Staffing

In the introduction, it was said that there are some minor flaws in an otherwise sound structure. Staffing is somewhat inappropriate and some managerial jobs are being done by the wrong staff members. To understand the present situation adequately, it is necessary to understand the following recent history of staffing and related events in automotive services:

- FY 1978 was the first year of complete decentralization of the automotive depots.

- In FY 1979, the central office positions of supervisor of automotive maintenance and repair services supervisor were created and funded.

- Between FY 1979 and FY 1981, the computerized inventory system and the GasBoy system were installed. Unofficially (i.e., not by job description), the accounts clerk was made responsible for computer operations.
- In the four years between FY 1979 and FY 1982, three different individuals occupied the position of supervisor of automotive maintenance.
- In the same period, there were two different directors and one acting director of the Transportation Division.

Inevitably, during this rather difficult time of adjustment to both decentralization and frequent changes in the managerial-supervisory staff, essential jobs had to be assigned to available staff without regard for job titles or official job descriptions. Many of these informal managerial job assignments that were appropriate in the past are no longer appropriate, though some are becoming institutionalized.

The Present Situation

Acting under the division director, the supervisor of automotive maintenance is the highest level administrator and supervisor of automotive services and is responsible for all operations.[2] Though he obviously cannot be expected to carry out all jobs himself, it is reasonable to believe that he should perform all of the work involved in coordinating the maintenance and repair program, state inspections, computer inventory systems and data acquisition, insurance and warrantee programs, and staff training. At present, however, the supervisor of automotive maintenance devotes a considerable amount of his time to jobs that are primarily technical, not administrative or supervisory. For example, he develops specifications for parts and vehicles, investigates the reasons for too frequent replacement of parts, and consults with depot heads on shop problems. Thus, some of the administrative jobs he should be doing are delegated to other staff members.

The senior accounts clerk continues to be responsible for all computer operations, which, by this time, should be coordinated by the supervisor of automotive maintenance. Recently, she has been made responsible for analyzing the vehicle exception report, which identifies vehicles that exceed specified limits of fuel consumption or repairs. This particular job should be done by a specialist in automotive maintenance or technology, not by either an accounts clerk or the supervisor of automotive maintenance.

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[2] Department of Personnel Services Job Description 922.

The position of repair services supervisor is a curious one at best, and managers of the Transportation Division said that they do not know why the position was ever created. According to the job description, the repair services supervisor is responsible for almost all of the administrative and supervisory duties for which the supervisor of automotive maintenance is also responsible.[3] In addition, the repair services supervisor is responsible for a wide variety of technical jobs: consulting with depot supervisors on shop problems, investigating and making recommendations for garage equipment, reviewing cost records of vehicles, making recommendations to improve economy, and evaluating the quality of supplies and materials. It is highly doubtful that any one individual can simultaneously and effectively carry out so many responsibilities. As things have evolved, then, the supervisor of automotive maintenance does some of the technical jobs that should be done by the repair services supervisor. The repair services supervisor does some of the jobs that should be done by the supervisor of automotive maintenance (coordinating state inspections, for example) and only some of the technical work for which he is responsible according to the job description.

The supervising auto mechanic who is the head of the Shady Grove shop has for some time been treated as a member of the central office staff and has been doing jobs that are actually the responsibility of the supervisor of automotive maintenance: coordinating staff training, consulting with salesmen, and coordinating the insurance and warrantee programs. Even without these extra central office jobs, the supervisor of the Shady Grove shop has more responsibilities than do the supervisors of the other three depots. There are more than three times the number of workers at the Shady Grove shop than there are at any other single depot. They handle major repairs for all other depots, maintain the buses and other vehicles parked on the depot lot, and maintain and dispatch MCPS motor pool vehicles. The supervisor must, then, deal not only with large and complex repairs but also with complex scheduling problems. He cannot perform central office jobs that should be done by the supervisor of automotive maintenance (or perhaps by the repair services supervisor) without taking time away from his major job, supervising the Shady Grove shop.

Problems In Supervision

Responsibility vs. Staffing

Supervising automotive mechanics, the heads of depots, should be able to devote the largest part of their time to supervising mechanics and other workers. In an interview, managers of the Transportation Division said that if supervisors could work closely with mechanics, they could save MCPS a considerable amount of money by helping with diagnosis of problems and, perhaps, reducing the number of parts that are now being replaced instead of being repaired. For the most part, however, the supervisors are not able to do this.

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[3] Department of Personnel Services Job Description 920.

As the administrative head of a depot, the supervising auto mechanic is responsible for all supervision and clerical work. The present organizational structure does not provide for line supervisors, and clerks are not assigned to depots. Therefore, the depot supervisor must personally do all of the supervision that gets done and all of the clerical work. Thus, while the supervisor-to-worker ratio at the depots is quite favorable, supervisors reported that clerical work, especially making service appointments and writing repair orders, absorbs most of their time and that they are able to spend 50 percent or less of their time supervising workers.

Supervision of Workers

Since depot supervisors are able to spend only 50 percent or less of their time supervising workers, it is not surprising that only a very limited amount of control is exercised over the quality of work. When a vehicle is to be worked on, a repair order is written and a mechanic is made responsible for the job. The mechanic accounts on the repair order for all of the time he spends on the job and either checks (on a checklist) or describes the work done. Repair orders are turned in to the depot supervisor. Supervisors said that because they cannot spend full time in the shop, they inspect some, but not all jobs and that the primary check on a mechanic's work is the repair order.

On their questionnaire, workers were asked questions about inspection of their work. Results are shown in Exhibit 21.3. The majority (58 percent) said that when they turn in a repair order on the completion of a job, a supervisor checks the order. This does not mean that a supervisor checks the work itself. Only 17 percent of the workers said that a supervisor inspects their work, and another 26 percent said a supervisor inspects repair work, but not other jobs (lube, oil change, etc.). Forty-six percent said, however, that a supervisor never or almost never inspects any work. Apparently, it is common practice to road test vehicles after the completion of a repair job that affects how a vehicle runs. The road test is done by the mechanic who is responsible for the job according to 74 percent of the respondents, not by a supervisor. The workers, then, confirmed what was reported by the supervisors: more reliance is placed on repair orders as a check on work than on direct supervision and inspection.

Control of Inventory

Controlling and accounting for parts has been a major problem in the Transportation Divison (see Part IV, the auditor's report). Part of the problem has been inadequate control at the central office of the information going into the computer. However, managers and supervisors said that control

Exhibit 21.3

WORKERS' RESPONSES TO QUESTIONS[a] ABOUT INSPECTION OF WORK

Questions	Response Choices	Percentages Of Respondents
When you fill in a repair order and turn it in, who usually checks to see that the work needed was actually done?	Supervising auto mechanic	41
	Lead auto mechanic	17
	An auto mechanic	9
	Nobody	17
	Don't know, no response	16
When you finish a job, does your supervising auto mechanic or lead mechanic inspect your work?	Always, for all jobs	17
	Always for repair jobs, but not for others	26
	No, never or almost never for any jobs	46
	Don't know, no response	11
At your depot, is it usual to road test a vehicle after a repair job has been done (when the repair affects how the vehicle runs)?	Yes, always or almost always	80
	Sometimes yes, sometimes no	13
	No, rarely or never road test	0
	Don't know, no response	7
When a vehicle is road-tested, who does the road test?	Supervising auto mechanic or lead auto mechanic	11
	A mechanic who has been given responsibility by supervisor	9
	The mechanic or worker who did the work	74
	Don't know, no response	6

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[a] Auto mechanics, service workers, and tire repairers as a group.

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over parts at the depots can also be a problem, though again they said that a system is in place. Each depot has a parts room and a parts clerk. When a mechanic needs a part, he is supposed to present a repair order to the parts clerk, who issues the part and, in theory, signs the repair order to show that the part was issued. Repair orders are eventually sent for processing to the central office, where information about the parts used on the job is entered into the computer and charged against the parts inventory. The accuracy of the repair order determines the accuracy of the data entered into the computer.

Workers were asked questions on the questionnaire about control of parts. The results, which are shown in Exhibit 21.4, suggest that there is actually little control even though managers say a system is in place. One control, for example, might be to require workers to "trade in" a used part as evidence that a new part is needed or, if for no other reason, because some parts can be rebuilt. However, 48 percent of the workers said this is not required at all or is not a regular requirement. Probably because parts clerks have to do some of the depot's clerical work and sometimes have to go to Shady Grove to get parts, stock rooms are not always supervised. A majority of workers (50 percent) said they always or at least sometimes can get parts or supplies from the parts room for themselves without having to ask a parts clerk for them. Thirty-three percent said that as far as they know, nobody checks to see that the parts and supplies charged to a repair order are actually used on the job.

Training Of Managers And Supervisors

Entry Level Qualifications[4]

To qualify for the position of supervisor of automotive maintenance, the highest administrative-supervisory position in automotive services, an individual must have a college degree, trade school training in automotive maintenance, and experience in fleet maintenance operations and computerized inventory systems. However, in the job description, these apparently stringent requirements are modified by the statement, "or any combination of education... and experience necessary to perform effectively in the position." This means that an individual who may lack some important training or experience, perhaps particularly in computer applications, can be hired into the position.[5]

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[4] The concern here is with job descriptions and entry level requirements, not with the qualifications of individuals now occupying positions.

[5] Because it is unlikely that an individual with the required education and extensive experience in fleet operations and maintenance would also have been able to get experience in computer operations, and because the computer inventory systems in the Transportation Division are comparatively new.

Exhibit 21.4

WORKERS' RESPONSES TO QUESTIONS[a] ABOUT CONTROL OF PARTS AND SUPPLIES

Questions	Response Choices	Percentages Of Respondents
When you have to get a new part from you parts department, do you have to turn in a used part before you are given a new one?	Yes, always, all parts	4
	Yes, always, but only large parts	37
	Sometimes, but not a regular requirement	33
	No, no trade-in ever required	15
	Don't know, no response	11
At your depot, can workers get parts or supplies themselves instead of having to ask the parts clerk for them?	Yes, always or usually	9
	Yes, but only once in a while	41
	No, it's never allowed	48
	Don't know, no response	2
When you fill out a repair order and turn it in, who usually checks to see that parts and supplies charged to the job were actually used on the job?	Supervising auto mechanic	17
	Lead auto mechanic	15
	Depot parts clerk	13
	Nobody (that I know of)	33
	Don't know, no response	22

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[a] Auto mechanics, service workers, and tire repairers as a group.

To qualify for the position of repair services supervisor, an individual must be a journeyman auto mechanic; have supervisory experience in automotive repair; be able to plan, assign, and supervise the work of depot heads; and be capable of supervising record keeping. The qualifications do not reflect the fact that many of the assigned responsibilities are administrative or that the largest part of record keeping in automotive services is done by computer. Again, then, an individual who lacks important training and experience can qualify for the position.

Job qualifications for supervising auto mechanics and lead auto mechanics are straightforward. Both must be journeymen auto mechanics and have the ability to supervise other mechanics. However, no specific supervisory training is required to qualify for either position.

Training Offered by MCPS

Though individuals who may lack certain training or experience can be hired, MCPS offers them little or no training once they have obtained positions. The supervisor of automotive maintenance and the repair services supervisor positions are not A&S, and therefore individuals occupying them are not able to take in-service courses designated for A&S staff. Though there are in-service courses in supervision and in how to operate computers, they are probably of little value to someone who must manage computerized inventory systems or use computer-produced data to manage fleet maintenance operations. As was pointed out in the last chapter, some shop supervisors and mechanics have been able to take in-service courses in supervision, but it is difficult for a mechanic of any level to enroll in such courses.

Discussion

Organization

One of the most important findings presented in this chapter is that the present organizational structure of automotive services is sound. The central office is organized, staffed, and equipped to manage a decentralized system of depots and services. However, as has been shown, there are problems, primarily of control of operations. The major issue, then, is how the organization can be strengthened to increase control and increase supervision. Further discussion and recommendations will be presented in Chapter 23, following a discussion of technological planning in the next chapter.

Staffing and Job Assignments

Some of the lack of control over operations may result from the way in which central office responsibilities and jobs are assigned. Giving jobs to anyone who happened to be available may have been reasonable in the early days of decentralization and frequent turnover of the managerial-supervisory staff. However, diffusion of responsibility can lead to a situation in which some jobs "fall through the cracks." There is now no good reason why the supervisor of auomotive maintenance should not take over and personnally perform all of the jobs of coordination that are now being done by the repair services supervisor, the supervising mechanic who is the head of the Shady Grove shop, and the senior accounts clerk. The director of the Transportation Division reported to the MORE staff that the supervisor of automotive maintenance could indeed perform all of those jobs provided that he did not have to do the technical jobs that now take up so much of his time (and see later).

The position of repair services supervisor has a grade of 21 on the MCPS supportive service scale. If the supervisor of automotive maintenance carried out all of the coordinating jobs for which he is responsible, there would be no need for the position of repair services supervisor. Instead, a lower level technical, non-supervisory position could be created, an automotive technical specialist or some similar title, and the individual in the position would perform all of the technical jobs that need to be done in automotive services.[6] This, of course, would enable the supervisor of automotive maitenance to carry out his administrative and supervisory responsibilities.

Supervision

Supervision of work (in the sense of consulting with mechanics) and control of parts at the depots are inadequate. Far too much of the supervisors' time is spent on clerical work. If managers of the division are right, this costs MCPS a considerable amount of money each year. The problem can be solved only by providing clerical support at the depots and creating line supervisory positions. How this can be done is discussed in Chapter 23.

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[6] While the need for such a position has been partly documented here, the next chapter is devoted entirely to a discussion of technological planning and the advantage of creating the position of automotive technical specialist.

Recommendations

Recommendations that stem from the findings presented here are made in Chapter 23 because they are related, in part, to technological planning, another managerial function that is discussed in the following chapter. Chapter 23 also includes discussion of and recommendations for rewriting job descriptions and the training of managers.

CHAPTER 22

TECHNOLOGICAL PLANNING

Introduction

The automotive services staff have little or no control over how MCPS vehicles are used or driven. Therefore, they can help reduce vehicle operating costs and the costs of pupil transportation, school plant maintenance, etc. only in the following major ways: [1]

- Develop more efficient ways to do repairs or to make modifications on vehicles
- Evaluate products already in use to identify those that give the best service at the lowest cost
- Test new products or technologies for cost effectiveness under conditions of operation in MCPS (but only well-established products or technologies).

All are responsibilities of the supervisor of automotive maintenance but are to be carried out primarily by the repair services supervisor according to the job description (see previous chapter). Unfortunately, automotive services is not adequately prepared to do technical development, product evaluation, or product testing.

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[1] Operational planning has already been discussed in Chapters 17-21. Resource planning is done as a part of budget planning for the entire Transportation Division and has been discussed in various chapters in Part II and in Chapter 17 of this part of the report.

Development

As anyone who has ever attempted a repair job learns from experience, there is a "right" way and a "wrong" way to go about it. Doing it the wrong way usually wastes time and effort and can also waste materials. Or, to put it differently, there is a cost-effective way and a costly way to do virtually any job. Obviously, when maintaining a fleet as large as the one operated by MCPS, doing jobs in the most cost effective manner can save large amounts of time, effort, and materials--which translate into dollars.

Developing cost effective ways to make repairs or modifications on vehicles takes time and effort. For example, it is possible that one day MSDE or MVA will require that seat belts be installed on all school buses.[2] It would take time to determine which of the seat belts now on the market meet state specifications and promise to be most servicable at the lowest cost. It would take a considerable amount of work in a shop to determine the most effective way to install the belts, that is, to answer questions like the following:

- o It is more efficient to remove all seats and drill holes or to work around the seats?
- o Is it necessary to use bolts, or can other fasteners like rivets be used? What about welding?
- o Can one worker do the job alone or is it more efficient for two or more to work together?

Eventually, when the most efficient technique had been decided upon, it would take additional time to train mechanics or to train supervising mechanics, who, in turn, would train the mechanics and auto service workers.

Technological development could, by itself, be almost a full time job in automotive services because there are so many questions about cost effectiveness that could be asked. However, as was shown in the previous chapter, if the fictitious situation occurred tomorrow, the supervisor of automotive maintenance would have to take time away from his administrative-supervisory duties to develop bid specifications for seat belts and confer with the Procurement Division. Depot supervisors would not have time to do the necessary experimental shop work, and mechanics would probably be left largely on their own to develop methods of installation. Those methods might not be the most cost-effective.

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[2] A very bad idea according to all of the literature reviewed by the MORE staff. However, seat belts have been required in some school districts, so the example is not particulary far fetched.

Product Evaluation and Computer Support

Evaluating products already in use and purchasing those that prove to be most cost effective can apparently yield only modest savings. However, small savings would be magnified by the size of the MCPS fleet and by the number of miles logged by the vehicles. For example, if it were shown that a particular brand of bus tire reduced costs by only 1/100 of a cent per mile, the use of that brand on all buses would result in a saving of $1,000 in a typical year in which buses log 10 million miles. And, of course, tires are only one component of vehicles. There are almost literally hundreds of others: windshield wiper blades, brake linings, shock absorbers, etc. Small savings on many of these parts multiplied by the 1,000 vehicles of the MCPS fleet, by miles, or by time of service could therefore amount to thousands of dollars in the total.[3]

Vehicle Master File

The central automotive services staff should be in a unique position to evaluate the quality and cost of any product used on MCPS vehicles, because the division probably collects more data about the products it uses than any other unit in MCPS. Every mile a vehicle travels and every gallon of fuel it consumes is—in theory, if not always in actual practice—recorded by computer. Every part of a vehicle that is repaired or replaced and all labor charges and costs are recorded by computer and charged to a specific vehicle. All of these computerized data make up what is called the vehicle master file. Unfortunately, at present, the data are not available in a useful form.

Data Needed in Product Evaluation

Data are of value only when they are reported or displayed in a useful way. To evaluate the cost effectiveness of tires made by different manufacturers, for example, the supervisor of automotive maintenance or an automotive technical specialist would have to be able to get a printout that might look something like the following:

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[3] Of course, there are proprietary parts that must sometimes be used, open bidding, and so on. While they complicate the picture, they do not change the principle.

Manufacturer	Average Unit Cost	Mean Miles Before Replacement	Cost Per Mile
Brand A	$160	31,000	$0.0052
Brand B	$150	30,000	0.0050
Brand C	$135	25,000	0.0054

That is, the computer would have to sort the data by manufacturer, calculate averages for a large number of vehicles, and calculate costs per mile. Before basing a decision on these data, the central office staff might also want to see breakdowns by type of vehicle or average number of tire repairs.

Present Limitations

At the present time, nothing of this kind is possible. A large number of computer printouts are regularly produced, among them the following:

- 9 weekly transportation transaction reports
- 6 weekly tables showing vehicle capacities, mechanics' salary rates, and the prices of fuel and oil
- 17 monthly transportation reports
- 2 year-end vehicle expense reports (i.e., by individual vehicle)

All 34 are primarily accounting reports and do not provide the information needed to evaluate products. There are no computer programs to extract different data from the vehicle master file, perform calculations, or display the data in useful ways (as in the above example). While the automotive services central staff can request reports for which programs are already written, they cannot use their terminal to call up, display, or manipulate data in different ways. Finally, some of the data that would be essential for evaluating products are not always entered into the vehicle master file. The MORE team ran an audit of the FY 1981 file and found that the following were almost always missing: engine size, engine type, chasis manufacturer identification, and body manufacturer identification. Other important data were also not entered into the file consistently, and gasoline and mileage

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[4] This is merely a simple example of what data would be needed and, for the sake of illustration, ignores the fact that tires are purchased by contract in bulk lots.

data are suspect (see auditor's report, Part IV). While this is a managerial, not a computer system problem, it means that even if programs were written to produce new and operationally useful reports, the data would still not be useful because they would be incomplete or inaccurate.

Testing New Technologies For Cost-Effectiveness

Under changing economic conditions, some old, well established, and widely accepted technologies take on new importance and sometimes promise dramatic savings. For example, the diesel engine has existed since 1892 and has been the workhorse of industry all around the world. The diesel has been proved repeatedly to be more fuel efficient than the gasoline engine (50 percent to as much as 100 percent under certain conditions) and some diesel maintenance costs are lower. Only comparatively recently, however, has there been any great interest in using diesel engines in vehicles like passenger cars and school buses. As a very rough estimate, if a diesel bus were to get just 50 percent better fuel mileage than a gasoline powered bus, an all diesel school bus fleet would reduce fuel costs in MCPS by nearly $1,000,000 a year.[5]

The use of liquid propane (LP) as an automotive fuel is a relatively new but thoroughly well-tested technology. In this case, the difference in price between gasoline ($1.15 per gallon in 1981) and LP (74¢ in 1981) makes LP an attractive alternative to gasoline. Some states are now using LP in school buses. This is not permitted as yet in Maryland. However, LP could be used as a fuel in MCPS service vehicles and would be particularly well adapted for use in Maintenance Division trucks. Again as a rough estimate, using LP in all Maintenance Division trucks could reduce fuel costs by as much as $100,000 a year.[6]

Minor technological improvements can produce modest, but nonetheless important savings. But major or minor, large or small, the technology or the product has to be tested. It is important to understand that "testing" in such cases does not mean testing the technology or product to find out if it really works. Rather, it means determining whether or not it will prove to be cost-effective under the conditions of operation in MCPS. This involves a thorough analysis of all obvious as well as hidden costs, problems, and potential benefits. In addition, it should involve trying out the product or technology and keeping and analyzing records of costs as would be done in product evaluation. MCPS and automotive services are not ready to carry out this kind of testing effectively, as can be demonstrated by two recent cases: the "test" of diesel and the failure to test LP.

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[5] Assuming 10-million fleet miles and equal cost of gasoline and diesel fuel. This does not necessarily mean, however, that diesels would be more cost effective than gasoline powered buses in MCPS, a case that has yet to be proved.

[6] Based on 2,000,000 fleet miles and the 1981 differential in price between gasoline and LP.

Diesel Buses

In December 1980, the Board of Education recommended that a study be made of the possible use of diesel-powered vehicles in MCPS. Shortly thereafter, the director of the Department of School Services formed a diesel study committee made up of representatives from various divisions, including, of course, the Transportation Division. In April 1981, the director of the Transportation Division asked for and received permission to carry out a test of an MCPS school bus that was originally gasoline-powered but, for the purposes of the test, was converted to diesel. The bus was put into normal home-school-home service in September 1981 (FY 1982). By December 1981, the director asked for and received permission to purchase 49 diesel-powered buses with funds already provided in that fiscal year's budget.[7] In March 1982, the Transportation Division asked that funds for 30 more diesel buses (this time specified as diesel) be included in the FY 1983 budget, and the Board of Education and County Council approved. It now looks very much as if MCPS may be on the way towards a commitment to an all diesel school bus fleet.

Though the whole process seems reasonable as described, the decision to purchase diesel buses was not based on adequate cost-effectiveness data.[8] An independent study of diesel buses conducted by the MORE staff revealed that there are many hidden costs and problems and that diesels may not be more cost-effective than gasoline powered buses.[9] However, as far as the MORE team could determine, the study committee did not make a report on all potential costs and problems in the operation and maintenance of diesels. Furthermore, data on fuel efficiency were collected for only three months--though fuel efficiency was not in question and the data were not the only cost-effective data to be considered.

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[7] In the FY 1982 budget it was not specified that the buses should be diesel-powered, though suppliers had been asked to bid on both gasoline and diesel buses.

[8] This is not a criticism of the decision, which may very well have been correct. It must be remembered that this case is presented only to illustrate the fact that the Transportation Division does not yet have the capacity to carry out an adequate testing program.

[9] C. A. Seitz and E. Cohen-Rosenthal, A Comparison of Costs: Diesel and Gasoline Powered Vehicles, Department of Educational Accountability, Montgomery County Public Schools, September, 1981.

It may turn out, even when all costs are taken into account, that diesel buses will save money for MCPS simply by reducing fuel costs. However, it will not be because of the "test" that was conducted or the data that were collected during what should have been a cost-effectiveness study. In fact, all of the problems that have already been discussed militated against a successful study: the inadequacy of the computer system in automotive services and the inability of the central office staff to devote full time to the test. In addition, the study committee was not required to make a full report, and a critical review was not made of the data that were collected to see if they actually supported the case for diesel buses.

Liquid Propane (LP)

Though the use of LP as a fuel in Maintenance Division trucks might reduce fuel costs by as much as $100,000 a year, LP was not tested when MCPS was offered the opportunity to conduct a test with the help of the Montgomery County government. Of course there is no *a priori* proof that LP would be cost effective under the conditions of operation of the vehicles in MCPS or that any money would be saved. But that is the purpose of testing, and the idea was (and still is) worthy of investigation.

The situation developed as follows: In 1981, the Montgomery County government began to test the cost-effectiveness of LP in 30 of its vehicles. At the time, Mr. S. K. Sawhney, chief of the Division of Equipment Management (Department of Transportation) invited MCPS to participate in the test. His idea was that MCPS would convert 20 to 30 vehicles and set up an LP station at the Shady Grove depot. He held meetings to explore the idea with staff members of the Department of School Facilities, the Procurement Division, and the Transportation Division. Had MCPS joined in the venture, there would have been a very low financial risk and very high potential payoff. For example, the county government converted 30 vehicles to burn LP at an approximate cost of $1,000 per vehicle. The $30,500 contract included the following:

- Conversion of the vehicles by the contractor's trained mechanics[10]
- Training of drivers and county mechanics by the contractor
- Underground and above ground storage and pumping facilities (the contractor owns them, but can remove only above-ground facilities)
- Hook-up of pump to the GasBoy computer system

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[10] The county government made a total conversion, i.e., gasoline tanks were removed. However, there is a so-called dual fuel system that permits the use of LP and gasoline interchangeably.

Mr. Sawhney estimated the payback period at 18 to 24 months (based on the 1981 cost of $1.15 per gallon of gas and $0.74 of propane) from a reduction of fuel costs alone, without also considering reduced maintenance costs.[11]

As far as the MORE staff could determine, no one in MCPS made the clear and deliberate decision not to join the county government in the test of LP. The most likely vehicles on which to conduct the test would have been Maintenance Division trucks; but automotive services mechanics would have had to be trained to maintain the vehicles, and automotive services would probably have had to monitor or supply the Maintenance Division with fuel consumption data. Managers of both units reported in interviews that they were interested in the project, and none claimed responsibility for deciding not to cooperate in the trial. Both are probably true. It is likely that since no one was responsible for making the decision, no decision was made.

This case illustrates the fact that even if all other problems of product testing were solved (computer support, etc.), the managers of automotive services have been placed in a peculiar and awkward situation. They operate a central service for all MCPS vehicles and are responsible for technological planning, presumably also for all vehicles in the MCPS fleet. Yet it is not clear that they have the right to make decisions to test innovations that might reduce operating costs of vehicles assigned to units other than the Transportation Division. At the same time, other units are certainly not equipped to carry out tests or to maintain test vehicles. As a result, decisions that might save thousands of dollars annually may not be made.

Discussion

Technological planning and development are the major ways in which the automotive services staff can make substantial contributions to reducing costs. In fact, job descriptions make the staff responsible for developing better ways to perform work, evaluating product, and technological innovations. But as has been shown here, the staff do not have the ability to carry out their responsibilities, even, as in the case of the diesel "test" when they are confronted by a real need to do so.[12] Providing automotive services with the capacity to do the job will take time but should not be costly.

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[11] LP is clean burning and produces few contaminants. Its use therefore reduces maintenance costs.

[12] In that case, the Board of Education recommended that such a study be made.

Short Term Goals

As was shown in the last chapter, if the supervisor of automotive maintenance carries out all of the coordinating functions for which he is responsible, the position of repair services supervisor can be eliminated. A new, non-supervisory position, automotive technical specialist, can be created at a lower grade. The individual occupying the position can be made responsible for all technological planning and related functions. (See further discussion and recommendations in Chapter 23.)

In Chapter 15, it was shown that managers in the central office of the Transportation Division need to be trained in the fundamentals of computer management and data processing. The central office staff of automotive services probably need training in computerized inventory systems. Since the training is needed whether or not they engage in product evaluation and testing, there is no good reason why plans for training could not be made in the future.

Providing automotive services with adequate computer support should not be costly. A kind of data base, the vehicle master file, already exists, and the automotive services central office already has a terminal tied to the ESC mainframe.[13] In the immediate future, then, it should be possible for the Data Processing Division to write some programs to produce a limited number of useful reports, perhaps on some selected parts that are frequently replaced: tires, brakes, etc. Meanwhile, managers of automotive services must begin to exercise better control over the data that go into the computer (see Part IV), and they must begin to do so as soon as possible--again whether or not they ever carry out product evaluation.

Long-Range Goals

At long range, the Transportation Division and the Department of Management Information and Computer Services need to develop a better data storage and retrieval system and the programs that would enable the automotive technical specialists (and other central staff) to manipulate data on the automotive services in-house terminal. This could be a large job, but the major cost would be MCPS staff time.

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[13] Those familiar with computer systems will recognize that the vehicle master file is not a true data base but is simply a set of tapes that are roughly the equivalent of a very large card deck.

Funding is another problem that needs to be solved long range. The Transportation Division does not now have funds in its budget to enable staff to purchase new products or equipment just to test them, and manufacturers cannot always afford to be lavish and provide the products. It would therefore seem reasonable to provide a modest amount of money for this purpose. Managers of the Transportation Division should develop documentation and projections to determine how much would be reasonable and, eventually, prepare a budget recommendation.

Permanent Advisory Board

It was not proved that diesel buses are more cost effective than gasoline powered buses because, in part, there was no critical evaluation of preliminary information, test procedure, and the data that resulted from the test. The failure to test LP in cooperation with the county government resulted from too great diffusion of responsibility and decision making. These are problems that can be solved rather quickly and easily. A permanent advisory committee could be established under the aegis and control of the associate superintendent for Supportive Services. Desirably, the committee would be made up of representatives of the Energy Management Team and of the Transportation, Maintenance, Procurement, Supply, and Food Services Divisions. Representation of the Energy Managment staff would assure that any tests and decisions involving attempts to reduce fuel costs would be in keeping with other plans elsewhere in MCPS. The reasons for representation of other units should be obvious. The following would be the functions of the committee:

- Review preliminary product and cost data, justification for testing, and the design of the test.
- Prepare a preliminary report and recommendation to test or not to test for associate superintendent for Supportive Services.
- Review all test results and cost effectiveness information and make a recommendation to the associate superintendent for Supportive Services to adopt or not adopt the product or technology.

To keep this review process from becoming restrictive and unwieldy, it might be desirable to establish some reasonable limits on the advisory board's authority. For example, perhaps the Transportation Division should be permitted to test minor innovations on any MCPS vehicle without approval from unit managers or the advisory board. Such details could easily be dealt with by the advisory committee.

Recommendations

Discussion of and recommendations for the position of automotive technical specialist will be presented in the next chapter, as will recommendations for the training of central automotive services staff. The following are other recommendations that are based on the findings presented in this chapter:

- The associate superintendent for Supportive Services should require the director of the Department of Management Information and Computer Services, the director of the Transportation Division, and the supervisor of automotive maintenance to do the following:
    - Review the recommendations for computer support of automotive services made in this chapter and in Part IV of this report
    - Determine the data, sources of data, types and formats of reports, and computer programs needed to enable automotive services staff to begin to evaluate products already in use
    - Determine the long range needs that would enable automotive services staff to evaluate all products and to test new products and technologies
    - Develop a schedule for meeting both short- and long-range data needs and for appropriate computer support
- The director of the Transportation Division and the supervisor of automotive services should determine how much funding would be required to enable automotive services to carry out an appropriate and reasonable program of testing of products and technologies and should prepare a report for the associate superintendent for Supportive Services.
- The associate superintendent for Supportive Services should form a permanent automotive product evaluation and testing committee made up of representatives from the Energy Management Team and the Transportation, Maintenance, Supply, Procurement, and Food Services Division, charging the committee with the following responsibilities:[14]
    - Reviewing product and cost data of automotive products and services that promise to reduce operating costs
    - Reporting findings and making recommendations for testing
    - Reviewing test design and results and making recommendations for adopting products or services

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[14] It is recognized that the associate superintendent for Supportive Services can form a permanent advisory committee. To assure that there are proper review procedures and to solve the problem of diffused decision making, it would be desirable for the Board of Education to establish such a committee.

CHAPTER 23

STRENGTHENING THE STRUCTURE OF AUTOMOTIVE SERVICES

Introduction

Automotive services is reasonably well organized to enable the staff to manage the decentralized depots. However, technical jobs take up too much of the time of the supervisor of automotive maintenance, but technological planning, one of the only ways the staff can reduce costs, is difficult and sometimes impossible. Managers and supervisors do not always exercise control over operations, at least partly because there are not enough line supervisors. Clerical jobs take up too much of the time of depot supervisors, who have no clerical help. There are also inadequacies in the way job descriptions are written and in the training of managers and supervisors.

Overview of MORE Recommendations For Staffing Automotive Services

Overview

Exhibit 23.1 is a summary of problems in managerial-supervisory staffing that have been documented in previous chapters.[1] The MORE staff believe they can

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[1] As has been true throughout this report, the MORE staff will not discuss the parts department staff, with the single exception of the parts runner. The Transportation Division has been dealing with the organization of the parts department and additional recommendations are made in the auditor's report, Part IV.

Exhibit 23.1

A SUMMARY OF MANAGERIAL-SUPERVISORY STAFFING AND RELATED PROBLEMS

- Central Office
  - Some administrative-supervisory jobs are assigned to inappropriate staff members.
  - Technological planning and other technical jobs that have the potential to reduce operating costs (for all MCPS vehicles) is a full-time job, but no one on the central staff can devote full time to it.
  - Technical jobs absorb too much of the time of the supervisor of automotive maintenance, the highest level supervisor in automotive services.
  - The supervisor of the Shady Grove depot is performing managerial jobs that should be done by the supervisor of automotive maintenance, and this reduces the amount of time he can devote to shop supervision.
- Shady Grove Central Shop
  - The supervisor of the shop has more responsibilities than supervisors of outlying depots but has the same position and grade as other supervisors.
  - Line supervisors are needed but are not provided for in the budget or in job descriptions. Mechanics serve as supervisors and specialists without additional compensation.
- Depots
  - Depot supervisors spend 50 percent or more of their time performing clerical work and less than 50 percent supervising workers. Clerical assistance is not provided at depots or at the Shady Grove shop.
  - Lead auto mechanics in charge of night shift workers need more authority.
  - Back-up and line supervisors are needed. Mechanics serve voluntarily as supervisors and specialists.
  - There is no provision for dispatchers at depots, though dispatchers could reduce the clerical burden of depot supervisors (see Chapter 15).

be solved rather easily, in the following ways:

- Eliminate the present position of repair services supervisor and create, at a lower grade, the position of automotive technical specialist.
- Upgrade the position of the present supervising automotive mechanic in charge of the Shady Grove shop and upgrade the positions of present lead automotive mechanics.
- Create line supervisory and specialist positions by establishing three grades of automotive mechanics, giving mechanics of the highest grade supervisory responsibilities
- Create two grades for automotive service workers, making clear distinctions between duties, responsibilities, and training needed to qualify for the higher position.
- Downgrade a number of automotive service worker positions and create the positions of lubrication worker, service station attendant, and parts runner.
- Add two FTE clerical positions fixed at four half-time positions, with one half-time position assigned to each depot.
- Create the position of dispatcher and assign a dispatcher to each[2] automotive depot.

As will be shown later, these changes could be made at almost no additional cost over a period of perhaps two years.

Job Titles

In the more detailed discussion that follows, the MORE staff have used different managerial-supervisory job titles than are now in use. The reason for this is that present job titles in automotive services are somewhat confusing and not sufficiently descriptive. The supervisor of automotive maintenance is actually the chief supervisor not only of maintenance but of all automotive services, including inventory and supply, the motor pool, staff cars, etc. The title "supervising auto mechanic" does not indicate that the supervisor is actually the administrative head of an automotive depot, and no distinction is made between the head of the central shop and supervisors of outlying depots. In some cases, titles do not indicate status. For example, division managers have said that lead auto mechanics, who are in charge of night shift crews, need to have more authority over workers. Calling them "assistant supervisors" would confer the authority they do not now have. The MORE staff, then, have used titles that seem appropriate and descriptive, though of course, the recommendations do not hinge upon these titles. In addition, it must be remembered that while new positions and titles would have to be created if the recommendations are adopted, none would be additional except the two FTE clerical positions.

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[2] See Part II, Chapter 15. These positions would be attributable to pupil transportation and are needed whether or not pupil transportation is reorganized as recommended in Chapter 15.

Recommended Managerial, Supervisory, And Clerical Staffing

Exhibit 23.2 shows MORE recommendations for managerial, supervisory, and clerical staffing. With one exception (line supervisors), recommendations for positions for mechanics, auto service workers, and new classes of workers are discussed in the next section.

Central Office Staff

The position of supervisor of automotive services is the present position of supervisor of automotive maintenance, simply retitled to reflect the fact that the supervisor is responsible for all automotive services. While the job description should be modified slightly (see later), there is no need to revise job responsibilities. As was shown in Chapter 21, the supervisor of automotive services can and should perform all of the coordinating jobs for which he is now responsible, provided that he does not personally have to do the technical jobs which now take up too much of his time.

If the supervisor of automotive maintenance coordinates all operations and central office functions, the position of repair services supervisor would no longer be needed. The position of automotive technical specialist, which would carry no supervisory responsibilities, could be created at a lower grade. The individual occupying the position would be able to devote full time to technological development, product evaluation and testing, and other technical jobs.

Central Shop Supervisor

In Chapter 21, it was shown that the supervisor of the Shady Grove shop has far more responsibilities than the supervisors of the outlying depots. When he asked that his position be reclassified, the positions of all supervisors of automotive maintenance were upgraded simultaneously. This did not change the fact that the supervisor of the central shop has more responsibilities but

Exhibit 23.2

MORE RECOMMENDATIONS FOR MANAGERIAL,[a] SUPERVISORY, AND CLERICAL STAFFING OF AUTOMOTIVE SERVICES

Present Position	Recommended Position
CENTRAL OFFICE	
Supervisor Auto Maintenance	Supervisor Auto Services
Repair Services Supervisor	Auto Technical Specialist
CENTRAL SHOP (SHADY GROVE)	
Supervising Auto Mechanic	Central Auto Shop Supervisor
Lead Auto Mechanic (night)	Asst.Central Shop Supervisor (night)
(No equivalent position)	Line Supervisors (Mechanics III)[b]
(No equivalent position)	General Clerk (1/2 time)[c]
(No equivalent position)	(Dispatcher, see Chapter 15)[d]
AT EACH DEPOT	
Supervising Auto Mechanic	Automotive Depot Supervisor
Lead Auto Mechanic (night)	Asst. Depot Supervisor (night)
(No equivalent position)	Line Supervisors (Mechanics III)[b]
(No equivalent position)	General Clerk (1/2 time)[c]
(No equivalent position)	(Dispatcher, see Chapter 15)[d]

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[a] Excluding the director of the Transportation Division and central office support staff not affected by MORE recommendations.

[b] See Exhibit 23.3 and accompanying text for discussion.

[c] Total of 2 FTE general clerical positions, the only additional ones in proposal.

[d] Dispatcher positions are recommended as new positions in pupil transportation. They are included here only to show that they would contribute to automotive services.

the same pay as other supervisors. Therefore, the MORE staff recommend that the imbalance be corrected. The position should be upgraded and retitled, and the changes should be reflected in a rewritten job description.

Assistant Shop or Depot Supervisors

As was mentioned earlier, managers of the Transportation Division reported that lead auto mechanics, the night shift supervisors, need more authority. Changing the job title to Assistant Central Shop (or depot) Supervisor would confer this authority on them and still maintain the reporting relationship between the shop or depot supervisor and the supervisor of the night shift. At present, there is a rather wide gap between the grade of a lead auto mechanic and a supervising auto mechanic. If the assistant shop supervisors (lead auto mechanics) are given more supervisory authority, the grade of the position should be raised. This would be consistent with the next recommendation: creation of line supervisory positions of Mechanic III.

Line Supervisors and Specialists

Line supervisors are needed, but are not provided for in the division's table of organization or budget. At present, mechanics are voluntarily carrying out essential supervisory jobs, but as was shown in Chapter 20, it is doubtful that they can be expected to do so indefinitely without reasonable and adequate compensation.[4] It was also shown that mechanics who have taken advanced training are serving as specialists, also voluntarily and without additional compensation. The problem can be solved by creating three grades of mechanics: Mechanic I, Mechanic II, and Mechanic III, making Mechanics III line supervisors and Mechanics II specialist (or quasi-supervisors).

Clerks

Because depot supervisors now spend more than half of their time doing clerical work, the MORE staff recommend that the full time equivalent of two new and additional clerical positions be created in automotive services. Positions and assignments should be fixed so that one half-time position is assigned to each depot. Obviously, a depot clerk could do routine clerical jobs and make service appointments with drivers. In addition, if it is true that a clerk could write most routine repair orders for monthly service, then the clerk could also relieve the depot supervisor of at least part of that time-consuming chore. In fact, if, as supervisors reported, large numbers of repair orders are simple and easy to write, managers of automotive services could develop a form, perhaps a checklist, that could be quickly filled in by a clerk. A clerk would not write a repair order that required description or diagnosis of a mechanical problem, but if supervisors were freed of most clerical work, they would have time to consult with drivers on repairs.

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[4] And there is a potential association issue.

Dispatcher

It was recommended in Part II that whether pupil transportation is reorganized or not, the position of dispatcher is needed and a dispatcher should be assigned to each automotive depot. It was shown that dispatchers could probably "pay" their own salaries by exercising control over the personal use of buses, etc. In addition, assigning dispatchers to depots would solve some problems in automotive services. A dispatcher could, for example, be responsible for the following:

- o Making service appointments for drivers (instead of asking drivers to make them at their convenience)
- o Assigning extra or emergency runs in such a way that drivers would have no reason to miss service appointments.
- o Notifying drivers of missed appointments if this became necessary, thus eliminating the present cumbersome system for notifying drivers
- o Taking emergency road calls from bus drivers, dispatching relief buses and drivers, and determining what kind of mechanical help is needed

If these jobs were done by dispatchers, depot supervisors would have the opportunity to confer at length with drivers about mechanical problems and to supervise automotive workers.

Position Structure
For Workers

There is a long discussion in Chapter 20 about the need for promotional positions for workers. It should be clearly understood that a new position structure should not be artificial (for the sake of promotion alone) but should meet the needs of MCPS and reflect the realities of differential job assignments. Therefore, the following considerations are important:

- o Line supervisory mechanics' positions are needed (see previous discussion). Some mechanics are now voluntarily performing supervisory jobs that are not part of their job description but are not paid accordingly.

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- Some mechanics, by virtue of advanced training, serve as specialists, consultants, and quasi-supervisors.

- Job responsibilities of auto service workers vary. Some workers function almost as full-fledged mechanics; other are given lower-level assignments. Assignments and responsibilities tend to reflect differences among workers in preservice training and experience, on-the-job training, initiative, etc.

- MCPS is committed by regulation and agreement to staff development (and appropriate rewards). However, there is no incentive for workers to improve their skills by taking additional courses in auto repair because they derive no job benefits by doing so.

- Morale of workers now suffers because there are few promotional opportunities.

Solving these problems would necessitate creating new position classes and grades and upgrading some extant positions. However, the cost of upgrading positions can be largely offset by downgrading others (see later discussion).

Managers' Recommendations

As was said in Chapter 20, the supervisor of automotive maintenance, in discussions with the MORE staff, proposed the following position structure, though he had not yet worked out all details or presented the proposal formally:

Mechanic II
Mechanic I
Tire Repairer II
Tire Repairer I
Apprentice Mechanic
Auto Service Worker

Other managers suggested that positions for lubrication workers and service station attendants should be created at grades below that of auto service worker.

The MORE staff believe there are some problems in this structure. It would not be reasonable to assign the grade of Mechanic II to both line supervisors and specialists who would have only quasi-supervisory responsibilities. Similarly, it would not be reasonable to assign the grade of Mechanic I to both specialists and other mechanics, including newly-hired mechanics.

The position assigned to tire repairers does not reflect the duties and responsibilities of these workers. It is true that at present, tire repairers have a higher grade (12) than auto service workers (9). But according to the job description, a tire repairer has only one job: changing and repairing tires. In contrast, an auto service worker has to have the preservice training, experience, and skill to perform a wide variety of mechanical jobs on vehicles, including changing and repairing tires. Furthermore, in actual practice, the auto service worker position is treated as the higher of the two.[5]

Establishing the position of apprentice mechanic is unnecessary and would probably create problems. MCPS Regulation GHD-RA (old number 415-4) makes provisions for placing trainees in higher-level positions. Furthermore, the position of apprentice would be of no value to either MCPS or the workers unless there were explicit training goals and a definite and limited training period. Setting goals and a time limit would imply that successful completion of the requirements in the allotted time would result in promotion. However, there could never be such a guarantee because budgetary constraints would always limit the number of mechanics assigned to the division. For the same reason, the number of apprenticeships would be limited, and very few apprentices could find themselves "stuck" in the position for years.

MORE Recommendations

MORE recommendations for a position structure for workers are shown in Exhibit 23.3. As was discussed earlier, a Mechanic III would have line-supervisory responsibility and be able to do jobs that are not now being done or are being done sporadically by supervisors: road testing vehicles, consulting on diagnosis, etc. Mechanics II would be specialists and would have consulting and quasi-supervisory responsibilities: assisting other mechanics in diagnosing problems in their specialty, serving as back-up to line supervisors, etc.

Creating two grades of auto service workers would make a clear and necessary distinction between workers who, because of preservice training and experience and on-the-job training ,can perform some mechanical work independently and those who cannot. Though the position of Auto Service Worker II would not be an apprentice position, it is nonetheless true that advancement to Mechanic I would be the next logical promotional step. However, there would be no implicit or stated guarantee that an individual would become a mechanic at the end of the fixed period of time.

Reasons for downgrading the position of tire repairer to just below that of auto service worker have already been given: entry-level and job requirements do not justify the present rank for tire repairer. Some present auto service

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[5] In one case, a tire repairer was "promoted" to the position of auto service worker so he could get mechanical training and qualify for the position of mechanic. He asked to be returned to his previous job because he made more money as a tire repairer.

Exhibit 23.3

MORE RECOMMENDATIONS FOR POSITION STRUCTURE FOR WORKERS IN ORDER OF RANK[a]

Automotive Mechanic III
Automotive Mechanic II
Automotive Mechanic I

Automotive Service Worker II
Automotive Service Worker I

Tire Repairer[b]
Lubrication Mechanic

Service Station Attendant[c]
Parts Runner

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[a] From the highest to lowest grade. In all cases, the Department of Personnel Services would have to establish the proper MCPS pay grade.

[b] To make cost projections (see text and Exhibit 23.4), it is assumed that the positions of tire repairer and lubrication mechanic would have the same grade.

[c] For the same reason as above, it is also assumed that the positions of service station attendant and parts runner would have the same grade.

worker positions can also be downgraded. Currently, at each depot, workers are assigned the job of lubricating vehicles on a rotating monthly schedule. Since the job is done daily, it is the equivalent of a full-time position for which workers are paid at an unneccessarily high rate. Similarly, gas station attendants are paid as auto service workers, even though the job requires far less training and experience than is needed to qualify for an entry-level position as auto service worker. In both cases, creating new positions at a lower grade would enable the remaining auto service workers to devote full time to mechanical work and, by reducing costs, help offset the cost of upgrading other positions.

The position of parts runner is badly needed, as has been pointed out in previous chapters. The job is now being done by an auto service worker who was placed on light duty, but since it is primarily a delivery job, it does not require the training or skill of an auto service worker. Creating the position would fill an obvious gap in the unit's table of organization at a salary cost lower than that of an auto service worker.

Estimation Of Cost
Of MORE Recommendations

Cost Estimates

Exhibit 23.4 summarizes MORE recommendations for staffing that have been discussed here. The number of staff members assigned to each position and total salary costs are based on the following:

- Only two positions are added: two FTE (four half-time) general clerks. All of the other positions have their counterparts in the FY 1983 table of organization and budget.
- Assigning six auto mechanics to the Mechanic III position and six auto service workers to the Auto Service Worker II position allows one each per depot and an additional two to the Shady Grove central shop.
- Four lubrication workers and four service station attendants allows one of each per depot. One auto service worker is presently serving as parts runner, and that is the number allowed.
- To eliminate differences in actual current salaries among workers in the various positions and grades, the D step, or median salary per grade, was used to calculate present position salary costs.

- An average salary based on the rank order of the position in relation to the MCPS salary scale was used to calculate new position salary costs.[6]

- Central office clerical and other extant support positions are not included because they are not affected by MORE recommendations. Dispatcher positions are not included because they have already been included in cost estimates presented in Chapter 15.

As can be seen in the exhibit, despite upgrading of 16 positions and the addition of the FTE of two general clerks, the MORE recommendations would result in an increase only of about $4,584 in salary costs. This is very close to a "wash," or no increase at all. It must be remembered that the MORE staff used an average salary to calculate new position costs and that everyone would not necessarily qualify for that salary. In any case, $4,584 is a very small price to pay for a full-time technical planner, six additional shop supervisors, and two clerks.

Some Caveats

In considering and evaluating the MORE proposal, the following must be kept in mind:

- This is only one of many possible organizational and position structures, though it is the one that the MORE team believe would yield maximum benefits at the lowest possible cost (essentially no additional cost).

- In some cases, the precise numbers of positions to be allowed in each category would have to be determined by the Transportation Division and the Department of Personnel Services.

- "Trade offs" are possible in some cases. For example, Transportation Division managers could determine that they need two parts runners instead of one, or three tire repairers instead of two. Such positions could be created by downgrading additional auto service worker positions.

- The Department of Personnel Services would have to determine position grades.

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[6] In each case, the average was a fair one which would approximately correspond to an MCPS grade or overlap at least two grades. The Department of Personnel Services would have to make the final determination of grade by position.

Exhibit 23.4

ESTIMATION OF COST OF MORE STAFFING PROPOSAL

Present Position	N	Total Salary[a]	New Position	N	Total Salary[b]
Supervisor Automotive Maintenance	1	$ 31,574	Supervisor Automotive Services	1	$ 31,574
Repair Services Supervisor	1	26,062	Auto Technical Specialist	1	22,500
Supervising Auto Mechanic	1	23,670	Central Shop Supervisor	1	25,000
Supervising Auto Mechanic	3	71,010	Depot Shop Supervisor	3	71,010
Lead Auto Mechanic	3	61,276	Asst. Shop/Depot Supervisor	3	64,000
			Mechanic III	6	122,500
Automotive Mechanic	38	742,976	Mechanic II	15	293,300
			Mechanic I	17	315,400
			MECHANIC SUB TOTAL	38	731,200
			Auto Service Worker II	6	93,200
			Auto Service Worker I	8	119,140
Auto Service Worker	23	342,534	Lubrication Mechanic	4	57,200
			Service Station Attendant	4	55,000
			Parts Runner	1	13,700
			SERVICE SUB TOTAL	23	338,240
Tire Repairer	2	33,738	Tire Repairer	2	28,500
(No equivalent present position)			General Clerk I (2 FTE)	2	25,400
TOTAL		$1,332,840	TOTAL		$1,337,424

DIFFERENCE = $4,584

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[a] To eliminate differences between highest and lowest salaries within grades, Step D, the median salary step, was used in salary and cost calculations for present positions.

[b] See text. An average salary based on rank order of position and the MCPS salary scale was used to calculate salary costs of new positions.

While these considerations are important, they are of relatively minor concern in the larger picture. More important is the fact that the structure of automotive services can be strengthened and supervisory control over operations can be improved with the addition of only two staff members (two FTE clerks) and little or no increase in cost.

Job Descriptions

Carrying out the MORE recommendations would mean that many job descriptions would have to be written or rewritten. However, only a few will be discussed here either because they present problems or would create future problems if they were not carefully written.[7]

Supervisor of Automotive Services

In Chapter 21, it was pointed out that an individual who lacks some important training and experience can qualify for the position of supervisor of automotive maintenance (supervisor of automotive services) by offering "substitute" qualifications. The job description should be rewritten to make it clear that there are no adequate substitutes for extensive training and experience in automotive maintenance, administration of fleet maintenance operations, and computerized gasoline and inventory systems. If it is believed that it would be impossible to recruit an individual with those stringent qualifications, it must be made clear that an individual hired into the position with less than optimal qualifications would have to acquire appropriate training within a year (or two at the very most), especially in the management of the very large computerized inventory system.

Automotive Technical Specialist

In conversations with the MORE staff, managers of the Transportation Division mentioned several times that it would be a good idea for automotive services to have what might be called a procurement specialist, someone to take responsibility for getting favorable prices on parts, etc.[8] They are probably right, and the automotive technical specialist should be responsible for some procurement functions that are now left in the hands of divisions: assisting in drawing up specifications for vehicles and components, for example. However, the automotive technical specialist should be a specialist in planning and development, not a factotum or an adjunct to the parts department, and this should be reflected in the job description.

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[7] As in Chapter 21, the concern is with job descriptions, not with the qualifications of individuals now holding positions.

An individual filling this position would have to be thoroughly trained in automotive mechanics, data analysis, statistics, and computer operations. It might be difficult to find someone with all these qualifications. A teacher of automotive mechanics might find the position attractive, however; and it would, of course, be possible for MCPS to train a well-qualified auto mechanic by a combination of tuition-reimbursed college courses and in-service courses.

Auto Service Worker

The present job description makes auto service workers responsible for a large number of jobs that vary considerably in technical difficulty. Some workers who qualify for the position do not have the training and skill to enable them to perform some of the more complex jobs, while others have the training or on-the-job training to qualify them to do mechanical work. Job descriptions should therefore be rewritten to differentiate clearly between Auto Service Worker I and Auto Service Worker II on the bais of preservice training and experience, on-the-job and in-service training, and job responsibilities.

Tire Repairer

The need here is to downgrade the position, not to rewrite the job description. However, a minor change should be made in the education requirements of either auto service worker or tire repairer. As was said earlier, tire repairers now have a higher grade than auto service workers despite the fact that auto service workers are required to have more knowledge and experience than tire repairers. They also have more and more complex job responsibilities. Apparently the difference on which the higher grade for tire repairers is based is the education requirement. Tire repairers are required to have completed the 10th grade, but auto service workers are required to have completed only the 9th. The difference in educational requirements should therefore be eliminated. It hardly matters how, since only one grade of school separates the two positions. Since the MORE recommendation is to downgrade the position of tire repairer, perhaps the educational requirement for auto service worker should be the higher of the two.

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[8] In the course of the MORE study of the Maintenance Division, managers said much the same thing. The MORE study of the procurement function in MCPS addresses some of the issues and problems.

Staff Training

Central Office Staff

In automotive services, the inventory system, including the gasoline distribution system is computerized; and all information from repair orders is entered into the computer. Therefore, the only access to information about inventory, labor, costs, etc., is through the computer. However, as far as the MORE staff could determine, some of the division's central office managers and staff need training in one or more of the following:

- How to exercise control over the data that go into the computer systems
- What data are available and how the data can be used for technological planning and development and, perhaps, for budget planning
- How to obtain services from the Division of Data Processing[9]

In view of the fact that there have, in the past, been constant problems in the division's inventory (see Part IV), this is a serious problem. The superintendent for Supportive Services should therefore make the training of central office managers and staff a matter of immediate priority.

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[9] In 1982, two clerks spent a large part of the summer tallying and totalling more than 10,000 gasoline and mileage tickets by hand, a job that could have been done by keypunch and computer in less than a week. The division director and the supervisor of automotive maintenance told the MORE staff that they did not know they could get service from the Data Conversion unit.

Other Supervisors and Workers

Since the positions recommended by the MORE staff make up a promotional ladder as well as an administrative-supervisory structure, a worker should be able to advance from the position of service station attendant or parts runner to central shop supervisor or, perhaps, supervisor of automotive services. Promotion should not be automatic or based entirely on years of service. Rather, advancement should depend on training, demonstrated skill, and job responsibilities. Therefore, minimum training prerequisites should be written into every job description as entry-level requirements.

If training is required for promotion, then, by negotiated agreements and regulations, MCPS would be obligated to provide it or make sure it is available. Much of it could be provided for workers through on-the-job training coupled with formal training offered by automotive manufacturers (assuming opportunities continue). Beyond that, MCPS should provide useful in-service supervisory training for present shop supervisors and, eventually, for line supervisors and workers who aspire to becoming supervisors.

Recommendations

- The staffing recommendations made in this chapter (summarized in Exhibit 23.4) should be carried out.
- Job descriptions should be reviewed and recommendations made in this chapter should be carried out by the Personnel Department in cooperation with the Transportation Division and the associate superintendent for Supportive Services.
- The associate superintendent for Supportive Services should make the training of the central office staff of automotive services a matter of priority and should arrange for them to be trained at the expense of MCPS in the following:
    - Function and operation of the automotive services computerized inventory, gasoline distribution, and cost information systems
    - Control of data that go into the computer systems
    - How available data can be used for technological and budget planning
    - How to work with the Division of Data Processing, e.g., how to specify data and other information needs, how to determine useful formats for printouts, etc.
- The associate superintendent for Supportive Services should work with the Department of Staff Development to obtain in-service training opportunities for shop supervisors and other workers in automotive services.

PART IV

AUDITOR'S REPORT ON THE INVENTORY SYSTEM

by

William W. Brown,
Internal Auditor

INTRODUCTION TO PART IV

Purpose

The Transportation Division, specifically the automotive services sub-unit, maintains three general categories of inventory: parts and supplies, tires and tubes, and gasoline and oil. In recent years, there have been rather large discrepancies in the inventory accounts and large adjustments have had to be made. Therefore, before the MORE study of the Transportation Division was begun, an internal audit of the division's inventory system was scheduled. Subsequently, it was decided that the audit was so closely related to the MORE study that it should be incorporated into it. Thus, the operation and management of the inventory system as a whole were audited for the following two reasons:

- To determine the possible causes for the large inventory adjustments encountered in recent years
- To evaluate the efficiency of the inventory system as a part of the MORE study

Scope

This audit intentionally concentrated on the inventory processes without going any further than necessary into processes performed by the Procurement Division, the Accounting Division, or Transporation Division systems that are covered in other parts of this and other MORE studies. The main concern was to ascertain whether information being generated by the inventory systems is processed efficiently and accurately.

Internal controls of both manual and automated processes were reviewed. Sampling was done as considered necessary to determine the accuracy of information that was entered into the parts inventory and gasoline systems. However, the main focus of attention was on controls to see whether or not information actually got into the systems. Since the parts inventory and gasoline accounting systems provide important information to the transportation system and the Accounting Division, the interface between the respective systems was closely examined. Although this report focuses on both the operational and financial aspects of the systems, they are addressed together unless specific circumstances warranted otherwise.

General Description of System

Parts, supplies, tires, and tubes are maintained on a computerized perpetual inventory system. The system provides information about current stock levels and usage data, which the Accounting Division uses to post inventory withdrawals from the general ledger. The system also feeds data to the transportation system, which compiles vehicle cost data. Gasoline and oil are accounted for on a partially computerized system that functions somewhat differently than the perpetual inventory system but which provides the same type of information to the Accounting Division and the transportation system. For discussion purposes, the perpetual inventory system for parts, supplies, tires, and tubes will be referred to as the parts inventory; the partially computerized system for fuel and oil will be referred to as the gasoline system.

Changes In Systems

During the course of this audit, it was obvious that some of the problems that were identified could be solved rather easily and that increased control over inventory could be achieved. Therefore, some changes were made in the systems before the audit was completed and some were made while the report was being written. In some cases, then, a description of a process in the report may not conform exactly to current actual practice. Though there are several such cases, the extent to which the changes were made as recommended has not been evaluated. Therefore, they do not affect the conclusions and recommendations presented here.

CHAPTER 24

VEHICLE PARTS INVENTORY SYSTEM

Introduction

The central parts department is a part of the Transportation Division's central office at Shady Grove Road. Parts and supplies are ordered from and received by the central parts department and distributed from there to the automotive depots by a so-called parts runner (an auto service worker). Computer terminals linked to the ESC mainframe are located at the central parts department, and information is entered into the computerized parts inventory by way of these terminals. Each depot has its own stock room and parts and supplies inventory.

Receiving, Transfers, Withdrawals

Receiving

All parts and supplies are received initially by the central parts department and transferred to other depots as requested. As parts are received, they are checked against the shipping document by a parts clerk to verify their condition, type and quantity. The parts clerk then puts the items into storage or prepares them to be shipped to another site. Receivings may include one of three types of items: parts to be included in inventory, parts to be charged directly to a vehicle, and shop supplies that are charged directly to an overhead account.

An accounts clerk enters parts from the invoice into the system at the division's CRT, using manufacturers' stock numbers most of the time. When a part is entered, the following information is keyed into the system: vendor number, part number, invoice number, number of units received, and price per unit.[1] After all of this information has been keyed, the system is updated by depressing the "enter" key. This sequence of events takes place for every item on an invoice.

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[1] If parts are sold in packages of more than one, a single unit cost is determined before they are entered into the system.

At the end of the day, the costs of all parts entered into the system are tallied on an adding machine and the tape is saved for control purposes. On the morning of the following day, an itemized listing of all entries recorded by the system is received from Data Processing. The total on this listing is compared to the total on the adding machine tape. If these totals do not match, the prior day's work is checked line by line until the discrepancy is found. Any discrepancies are corrected on the CRT.

Transfers

Since all parts are shipped to the central parts department, they must be transferred to the other depots. Parts requested by other depots must be entered on a parts requisition form by the parts clerk. These forms, which are not numbered (a major weakness in any control system), generally represent transfers that will be made from Shady Grove to the requesting depot. However, parts may also be transferred back to Shady Grove or among shops. Parts requested are accumulated by a parts clerk and delivered by the parts runner. All transfers (parts requisition forms) are sent to Shady Grove to be entered into the system by an accounts clerk. When transfers are entered into the system, the perpetual inventory records of the sending depot are reduced and the perpetual inventory records of the receiving depot are increased.

Inventory Withdrawals

When parts are removed from stock for use on a vehicle, they are entered on a repair order form (RO) by a stock clerk. Repair order forms are kept on the parts counter until all repairs on a vehicle are made. Each time a mechanic requests a part, it is entered on the RO by the parts clerk. When all repairs have been completed, the RO is sent to Shady Grove to be processed by an accounts clerk. Parts designated as direct-charge items are not entered into the system via the CRT. (RO's and direct charges will be discussed later as separate items.) Parts subtracted from inventory are totaled by an accounts clerk and entered on the bottom of each RO. At the end of the day, the total on the bottom of each RO that is processed is tallied on an adding machine; the tape is saved for comparison with a detailed listing provided by Data Processing the next morning.

Usage transactions are subject to the same cumbersome process as receiving and transfer transactions. That is, information such as RO number, vehicle number, etc., must be entered into the system for each part. In addition, information such as direct charges and labor information, which are included on the form, must be sent to Data Processing to be keypunched. The resulting tapes must then be merged with the information entered through the CRT to reflect all information recorded on a given RO. Although RO's are sequentially numbered, there is no control to ascertain whether or not they have all been processed.

Direct Charge Items

To keep the stock room and perpetual inventory manageable, slow moving or special-purpose parts are purchased as needed and charged directly to a vehicle. These items are cross-referenced to an RO on the invoice and are not entered into the parts inventory system. However, payments and withdrawals are processed through the general ledger inventory account in the Accounting Division the same as a regular inventory item.

Repair Order (RO)

The RO, in addition to being used as a source document to record inventory withdrawals, provides vehicle data, labor costs and other information to the transportation system to be used in determining vehicle cost data. Parts used on the RO are input via the CRT. All other portions are sent to keypunch. The resulting tapes are matched on RO number and used to update the vehicle master file.

Part Numbers

The present system uses manufacturers' parts numbers for identification purposes. This number was decided upon because it would avoid conversion tables and be consistent with numbers used on invoices. However, the following problems still exist:

- Numbers entered into the system must be configured properly (spaces, hyphens, etc.) or they will not be accepted. Part numbers written on invoices, however, are often abbreviated or scribbled, making it difficult to determine the proper format to key in.
- Number formats vary widely, making them hard to sort for report purposes. Some typical examples are as follows:

    67
    C8AZ6766A
    12-16
    1" Heater Hose
    550
    5 - 160X
    D2TZ13A809B
    950X16.5 T
    Hose Clamps

- When manufacturers have different numbers for comparable parts, some confusion is created as to whether to change the number in the system, change the number on the part and on the invoice, or list essentially the same part under two or more different numbers in the perpetual inventory system.

Rebuilt Parts

Some parts like engines, transmissions, alternators, starters, etc. can often be rebuilt or overhauled at much lower cost than buying new ones. Parts may be rebuilt by outside contractors or internally by automotive services mechanics.

External Rebuilding: Core Charges

When rebuilt parts are purchased, the transaction is, for accounting purposes, handled like any other purchase except for what are known as "core charges." That is, when a rebuilt part is purchased, a trade-in of an old part of the same kind is usually required. If there is no old part to trade in or if the old part is turned in at a later date, a "core charge" is added to the cost of the rebuilt part. Core charges for items such as rebuilt engines or starter motors are sometimes improperly accounted for. For example, when a rebuilt engine costing $2,000 is purchased, the invoice that is received includes a charge of $400, pending receipt of a trade-in engine block. The rebuilt engine is entered into the perpetual inventory system at $2,400, and the invoice is sent to the Accounting Division to be paid at $2,400. When the engine is used, both the perpetual inventory and the general ledger are relieved of $2,400. In the meantime, the trade-in is sent to the company, and a credit for $400 is received by MCPS. The $400 is credited to the general ledger inventory account, but no corresponding entry can be made to the perpetual inventory account. This has a cumulative effect and tends to overstate the perpetual inventory if the part has not been used or to understate the general ledger if the part has been used.

Internally Rebuilt Parts

Parts rebuilt by automotive services mechanics present a different problem than those rebuilt externally. Parts used for rebuilding are usually stocked in the stock room and must be properly accounted for to avoid understating or overstating the perpetual inventory.

At the beginning of the audit, the process used was as follows:

- o Parts were withdrawn from inventory and entered on an RO.
- o Upon completion of the rebuilt part, it was tagged with the RO number on which parts were recorded and placed on the shelf.
- o The RO was placed in a file until the part was used.
- o When the part was used, the RO number on the rebuilt part was noted on the RO used by the mechanic repairing the vehicle.
- o When the RO for the vehicle being repaired was processed, the RO for the rebuilt part was processed along with it.

Although this procedure got the job done, it was cumbersome and overstated the perpetual inventory until the rebuilt part was actually used on a vehicle. When an inventory was taken, the value of the parts recorded on the RO's in the rebuilt parts file had to be added manually to the quantity and value of the actual inventory, since they were still in stock but in the form of a rebuilt part. In short, parts used as components to repair or rebuild other parts remained in the perpetual inventory system until the rebuilt part was actually placed on a vehicle.

During the course of the audit, this problem was addressed. The following procedure was placed into effect in an interim attempt to solve the problem:

- o When parts are used on a rebuilt item, an RO is processed as a matter of routine, thus reducing the perpetual inventory.
- o The rebuilt item is placed on the shelf for later use.
- o The rebuilt item is entered into the system from the RO on which parts are recorded using the normal receiving process. The item is entered into the system at the value of the parts and labor used to repair the item.
- o The Division of Accounting manually debits the general ledger inventory account and credits the appropriate maintenance expense account and labor expense account to force the value of the rebuilt item back into the accounting records.
- o When the rebuilt item is used on a vehicle, the normal withdrawal process is used.

Again, this procedure accomplishes the objective, but causes the Division of Accounting to have to go through many extra steps in the process. It also tends to overstate the general ledger inventory account and the perpetual inventory account by the amount of MCPS labor used to rebuild the items.

Inventory Accounting

Inventory accounting goes through four phases before transactions are complete: procurement, perpetual inventory, transportation, and accounting. Each will be described briefly below.

Procurement System

Parts are purchased by one of four methods: regular, blanket, contract, and confirming purchase orders. This phase follows the normal procurement and accounting process and need not be discussed further for the purpose of this report.[2]

Perpetual Inventory System

The computerized perpetual parts inventory system was implemented in March 1980. The original intention was to keep track of inventory stock levels at each shop by entering items into the system as they were received and deleting them from the system as they were issued. However, as the system developed, it became obvious that it had the potential to supply much of the information needed by the Accounting Division and the transportation system. As parts are added to or withdrawn from the inventory system, the computer generates a history file that records all transactions entered into the system. The transportation system and the accounting system use data generated by this file in processing subsequent reports, as will be discussed in the next two phases.

Transportation System

This system is responsible for producing most of the reports used by the Transportation Divison. One important source of information for some of these reports is the transaction history tape that is created by the perpetual inventory system. This tape is merged with other tapes created by the transportation system to create vehicle cost data used in the following: Monthly Accounting Repair Activity Report, Vehicle Repair Cost Summary, Year End Reports, and the TR-4. These reports are described in Chapter 17, Exhibit 17.4

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[2] A complete discussion of these can be found in the Review of Procurement Practices In The Montgomery County Public Schools prepared by Touche Ross & Co., October 25, 1982.

Accounting System

When parts are purchased, they are entered into the perpetual inventory system from the invoice, as discussed in the section on receiving. Periodically, a Transportation Division accounts clerk assembles the invoices. The accounts clerk indicates the appropriate account(s) to charge, attaches the invoice to a purchase order, and sends it to accounting to be paid. When the bill is paid, the Accounting Division automatically debits the proper general ledger inventory account and credits cash. Once each month, an Accounting Division employee records withdrawals in the general ledger inventory account according to information supplied by the Vehicle Repair Cost Summary. The withdrawals recorded by the accounting system result in a debit to the appropriate vehicle maintenance expense account(s) and a credit to the inventory account.

At least once annually, a team of Transportation Division employees take a physical inventory of all parts on hand as of a given day. On the basis of this inventory, they prepare a reconciliation, comparing actual quantities on hand with the perpetual inventory. After differences have been verified by the inventory team, the perpetual inventory system is adjusted up or down by any difference that may have occurred. The inventory value is adjusted accordingly as a result of the quantity change and is compared with the value of the general ledger inventory account maintained by the Division of Accounting. The general ledger inventory account contains only the value of inventory on hand. Any differences between the adjusted value and the general ledger inventory account necessitate an adjustment in the general ledger inventory account. Adjustments are entered into the accounting system via a journal voucher that debits or credits the general ledger inventory account and alternately debits or credits the proper vehicle maintenance expense account(s).

Valuation, File Maintenance, And Labor Rates

Valuation of Inventory

In theory, the current perpetual inventory is maintained on a first-in first-out (FIFO) basis. When a part is transferred from Shady Grove to another shop, the value is transferred FIFO, and, at each shop, value is also maintained FIFO. However, the present system does not accurately reflect FIFO values. There is no master inventory file that shows grand totals of quantities and values of parts for the entire system, i.e., for all locations combined. Therefore, the oldest value in the system cannot be used when the inventory of a specific shop is reduced.

It should be mentioned here that the use of a FIFO-based system is peculiar to the Transportation Division. The Division of Supply Management and Food Services also have very large and complex inventories. They base values on weighted averages instead of on FIFO values, which simplifies their systems considerably.

File Maintenance

At present, the CRT operator has the ability to delete parts numbers, change prices, and change quantities of items within the system. There are few, if any controls on these functions, and changes can be made without the approval of the supervisor of automotive maintenance and without written documentation.

Labor Rates

Among the information listed on the RO is a mechanic code and the time taken to repair a vehicle. This information is keypunched, and the dollar value of the labor is computed by the system. The labor rate table must be manually updated for each mechanic each time a personnel action notice is created. This is a troublesome process and serves no practical purpose other than to assign a labor cost to the vehicle being repaired. An easier method to accomplish this objective would be to use a standard or average labor rate that would apply to all mechanics. Mechanic codes would not be needed and only one labor rate would have to be entered into the system. It is possible that the use of a standard rate would conflict with MSDE reporting requirements because, in the past, the state has demanded statements of actual costs. However, now that MSDE is funding by block grant, this requirement may no longer be in effect or, if in effect, not matter greatly.

Reports

The major reports used by the Transportation Division are prepared by the transportation system, with some of the data being supplied by the perpetual inventory system (see Exhibit 17.4). The following are the major reports created by the perpetual inventory system:

- Daily Activity Report

  Provides totals and types of all transactions entered into the system.

- Error List

  Lists any errors that may have occurred during the overnight process.

- Vehicle Parts Status List

  Lists all parts and their stock status at the end of business each day.

The original system design included several routines and/or reports that have either been circumvented or never implemented, including the following:

- Reorder List

  Provides a list of parts that are at or below the reorder point. This option has not been used since the system was put into production, because minimum stock levels have not been established.

- Usage Report

  Lists parts used within date parameters. This report provides usage data for bid requests and would also be useful in determining reorder points. Currently, only the Accounting Division uses this report to spot-check prices when paying invoices.

- Receipts vs. Payments Report

  Provides comparison of value of parts received with payments made through the accounting system. Control was to be on purchase order number, however this number is not being entered when receivings are entered because of the cumbersome process described in the section on receiving.

- Repair Order Comparison List

  Compares items used from parts history with monthly detail file from current transportation system.

Storage, Security, And Control

Storage

Each depot has a stock room in which parts are stored. Generally parts are kept in bins that are organized by vehicle manufacturer (Ford, International, etc.). Items not identifiable by make of vehicle are stored in general categories: batteries, tires, etc. At the Shady Grove depot where storage is a major problem, only parts are kept in the main stock room. Batteries are kept in a special locked battery room, and highly vulnerable automobile tires and tubes are kept in or between repair bays. Some tires are stored on the parking lot, either locked in a trailer or stacked in the open.

Security

During the day, a depot stock room is manned by a parts clerk who issues parts and records them on RO's. The stock room is generally off limits to anyone other than the stock clerk. However, it was shown in Chapter 21 that 50 percent of the workers said they sometimes get parts out of the stock room for themselves. During the night shift, only the Shady Grove depot has a parts clerk. At the other depots that have night shifts, mechanics get their own parts, which they are supposed to records on RO's.

All parking lots are surrounded by chain link fences with gates, but are accessible by anyone during the day shift. Usually one gate is left open during the night shift. As is pointed out in Chapter 19, there are potential security problems, because lots are very large, with areas that are dark or in deep shadow.

Stock Control

Stock control is accomplished through the process of recording receivings, transfers, and withdrawals, as discussed in previous sections. The perpetual inventory listing (Vehicle Parts Status Listing) is periodically spot checked by a parts clerk by comparing it with actual quantities on hand. The need to reorder parts is determined by a parts clerk by reviewing the current inventory listing or by observing quantities on hand.

Staffing

Exhibit 24.1 shows the staff assigned to inventory and parts control and their responsibilities. There are three major job assignment and staffing problems. First, the supervisor of automotive maintenance, who is not included in Exhibit 24.1, seems to play a limited role in the coordination and control of the system, though his job description clearly makes him responsible. The accounts clerk, who is not an administrator or supervisor, assumes major responsibility for coordinating computer operations.

The job description for parts clerk II was written in 1974. At that time, the Transportation Division had not yet been decentralized and there was only one stock room. According to the job description, the parts clerk II was simply the day shift worker; the parts clerk I was the night shift worker. Apparently it was not visualized at the time that the parts clerk II would, with decentralization, become the virtual head of a very large warehousing operation. The individual occupying the position is now doing jobs that are included in the original job description, but which have become far more complex and demanding.

Finally, since parts clerks are not assigned to the outlying depots that have night shifts, lead auto mechanics are responsible for the stock rooms. However, they are working supervisors and cannot do their own work and run the stock rooms at the same time. Therefore, as mentioned earlier, night shift mechanics get the parts they need for themselves. This constitutes a breakdown in control.

Exhibit 24.1

STAFF SUPPORTING THE PARTS AND INVENTORY SYSTEM

Central Office[a]

- Accounts Clerk

  Responsible for the entire computerized inventory system, including both the CRT linked to the ESC mainframe and the GasBoy system.

- Three Office Assistants I

  Two serve as computer operators, the third as a parts clerk.

  One of the positions is provided for in the budget. The other position is an "overhire," created by leaving an auto service worker position vacant and charging the office assistant's salary against that position.

- Parts Clerk II

  Responsible for receiving, accounting for, and transferring parts and supplies. The individual in the position has also been carrying out major procurement functions.

Shady Grove Central Shop

- Parts Clerk I, day shift (position vacant and frozen)

  Responsible for control and distribution of parts and for stock room.

- Parts Clerk I, night shift (duties as above). Now serving on day shift.

Automotive Depots

- Satellite parts clerks (3) day shift only

  Responsible for control and distribution of parts and for stock room.

- Lead Automotive Mechanic, night shift

  Responsible for stock room, but mechanics get their own parts and are supposed to enter information on repair orders.

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[a] The parts clerk II could be considered as part of either the central office or of the Shady Grove central shop. Many of the duties he now performs are central office functions.

In recent budget negotiations, the managers of the Transportation Division proposed that a new and additional position at Grade 14 be created: supervising office assistant II. Presumably, the position would be filled by the present accounts clerk, who as supervising office assistant, would continue to be responsible for the control of all computer operations. No positions would be "traded off," and the present position of accounts clerk and the overhire of the office assistant I would be continued. The new position, it should be noted, was not approved for funding, but it was reported that there was general agreement that such a position is needed.

Discussion

Inventory System in General

Although the inventory system as a whole has the potential for supplying needed information, there are some changes that, if adopted, would increase the speed, accuracy, and reliability of the information produced. Since the accounting system and the transportation system rely heavily on the accuracy of the perpetual inventory system, these recommendations, discussions of which follow, would also improve these systems.

Receiving, Transferring, Withdrawing

The procedure for receiving is cumbersome and lends itself to error because of the vast number of repetitive entries that must be made. A much more efficient and accurate system would be to enter common information such as vendor number, purchase order number, and invoice number only once at the beginning of the process for each invoice, then part number, units, and price for each item on the invoice. After entering the last item, the system would automatically extend the total for each part and provide a grand total for verification. If a visual check indicated a discrepancy, it could be corrected at that time. Once the information was correct, the system would be updated for all parts on the invoice by depressing the "enter" key. This procedure would be much less cumbersome, provide additional information for control, and create immediate editing capabilities that would allow errors to be corrected before updating the system.

Parts requisition forms are used to record transactions when parts are transferred from the central parts department to depots, from depots to the central department, or among depots. The forms are entered into the system at the Shady Grove office. Parts requisition forms are not numbered, and therefore it is possible that individual or groups of transfers might be omitted when updating the inventory of the various shops. While this would not create a serious problem in the overall picture, it would distort the individual inventories of the shops affected, creating a problem when trying to reconcile the physical inventory to the perpetual inventory at each location. It is recommended that a sequential numbering system be used on the transfer forms and that controls be instituted to ensure that all numbers have been accounted for.

It is recommended that the system be modified so that all information on an RO can be entered into the system via the CRT by a clerk in the Transportation Division's central office. This would eliminate double handling of each RO by the Transportation Division and Data Processing. The system should also be modified to permit entering common data on each RO only once, for instance, entering RO number and vehicle number only once, then entering part number and quantity for each part used. The screen would flash back price and extensions for each part and a total of all parts after the last entry. These amounts would be written on each RO by the clerk as verification that the transaction was completed and as a reference for audit purposes. A similar system could be developed for other data items included on the RO (direct charges, labor, etc.). A manual and/or automated system should also be implemented to ensure that all RO numbers have been accounted for.

Direct Charge Items

Direct charge items are reflected in the general ledger inventory account maintained by the Accounting Division, but not in the perpetual inventory account maintained by the Transportation Division. This situation adds unnecessary confusion to the overall inventory picture. Since these items are not inventoried, they should not be reflected in the inventory account. A more appropriate solution would be to charge all direct charge items directly to the proper vehicle repair expense account, thereby decreasing the risk of error in the general ledger inventory account.

Forms

All forms used by the system should be controlled by number. The issuance of forms should be controlled, and all form numbers that are issued should be recorded. A system for accounting for all forms should be developed.

Parts Numbers

The current system of using the manufacturer's stock number should be re-evaluated. A better system might be to create a unique numbering system with a fixed size and format. The first number or letter, for example, could represent a part for a specific make of vehicle; the second would tell whether it was a tire or battery; the third, fourth, and fifth some type of identifier; and so on. Manufacturers' numbers could be referenced in another field on the Vehicle Parts Status listing, and a separate master listing could be created to cross-reference manufacturer number to MCPS numbers. When deliveries are checked out by the stock clerk, the MCPS numbers could be entered on the invoice before they are processed.

Although possibly more cumbersome at the receiving level, a standard numbering system would place responsibility for numbers with the stock clerk where it belongs. The accounts clerk who enters this information into the CRT would be relieved from frequent cross-checking and running back and forth to verify numbers. Preparing and reading reports would be simplified because parts would be categorized and listed in logical sequence.

In recent years, the Montgomery County Government has been using an in-house standardized numbering system. The supervisor of the parts department reported that while there are some advantages in using manufacturers' stock numbers, the use of in-house numbers has been better in the long run.

Rebuilt Parts

The system for recording rebuilt parts should be redesigned to avoid excessive, clumsy entries and to prevent overstatement of the inventory value of rebuilt parts. The Division of Data Processing, in conjunction with the Division of Transportation, should devise a system of withdrawing parts used on rebuilt items and re-entering these completed items back into the system. This system should be easy to use with no intervention necessary on the part of the Accounting Division. The value of labor incurred by MCPS employees should not be included in the value of items included in inventory.

Valuation of Inventory

There are two possible approaches to correcting some of the problems in the way inventory is valuated: improve the present first-in-first-out (FIFO) system, or adopt another system using weighted averages. If a true FIFO-based system is desired, a master inventory file must be developed to include the total quantity on hand at each location and a grand total of quantity and value for all locations. When the inventory of a specific shop is reduced, the oldest value in the overall system should be used instead of the oldest value in the specific shop.

An alternative would be to use weighted averages. This would simplify the system and make it consistent with the one used in the Divisions of Supply Management and Food Services. It is not suggested that this should be done in the near future. However, if a major revision of the system is ever undertaken, it should be considered at that time.

File Maintenance

CRT operators should not be allowed to make changes in the system (delete part numbers, change prices, etc.) without prior approval of the supervisor of automotive maintenance and without written documentation. This documentation should be on pre-numbered forms that are filed and controlled by form number. The supervisor of automotive maintenance should be aware of all changes and the effect they will have on the perpetual inventory and accounting records.

Reports

For accounting purposes, there is no need to produce new routine reports. However, the reports that are currently produced could be better utilized for control and management. For example, the reorder list has never been used, because minimum stock levels have never been entered into the system. The receipts-vs.-payments report is being circumvented because purchase order numbers are not being entered into the system. Yet this report has the potential to assure that all parts paid for through the accounting system actually get recorded in the perpetual inventory system.

Security

Adequate storage facilities should be provided to safeguard expensive tires and control their issuance. Only authorized stock room personnel should be allowed in storage areas, and keys to these areas should be adequately safeguarded. In the case of satellite depots where there is no parts clerk on duty at night, authority and responsibility should be designated to an employee (but see below).

Staffing

The supervisor of automotive maintenance should assume responsibility for the coordination and management of computer operations. If he did so, there would be no need for an additional position of supervising office assistant II to control computer operations. Furthermore, if the recommendations discussed here were implemented, the system would become more manageable and there may be no need for the office assistant I position that is now being filled by an overhire. The job description of the parts clerk II needs to be rewritten to reflect current job responsibilities. The Department of Personnel Services would have to determine if upgrading of the position is warranted. Serious consideration should be given to providing parts clerks to the depots that have night shifts. The cost versus the benefit of increased control over stock goes beyond the scope of this audit report.

Recommendations

- The detailed recommendations that are discussed here for increasing the efficiency and accuracy of the inventory and accounting system should be implemented.
- Routine reports should be used for control and management, including the reorder list, which is not currently utilized. The receipts-vs.-payments report should not be circumvented, and purchase order numbers should be entered into the system.
- The Transportation, Accounting, and Data Processing Divisions should work together to establish standard labor rates (charges) and to reprogram the computer system to use standard rates instead of computing rates by using the individual mechanic's code and rate.
- Adequate storage facilities should be provided for tires.
- Only authorized stock room staff should be allowed in storage areas, and keys to these areas should be adequately safeguarded.
- The supervisor of automotive maintenance should assume responsibility for coordinating and managing computer operations.
- The job description of the parts clerk II should be rewritten (and perhaps of parts clerk I), and the Department of Personnel Services should determine whether an increase in grade is warranted.
- The director of the Transportation Division should determine the cost and benefits of creating additional parts clerk positions for the night shift.

CHAPTER 25

GASOLINE CONTROL SYSTEM

Introduction

Gasoline, oil, and transmission fluid are accounted for on a partially computerized system.[1] Gasoline pumps are located at the four automotive depots, the Sherwood High School transportation lot, and the Lincoln Center. They are used to deliver fuel to school buses and other MCPS vehicles. In addition, pumps are located at several high schools to fuel driver education cars. Fuel pumped at the four depots is recorded by GasBoy, the computerized delivery system; fuel pumped at other sites is manually recorded on withdrawal tickets. Oil and transmission fluid used in the auto shops are recorded on repair orders, but when delivered at the service stations are recorded manually on withdrawal tickets. These sources (GasBoy, repair orders, and tickets) provide the data used by the Accounting Division to post withdrawals from the general ledger inventory account and also feed information that is used to compile vehicle costs to the transportation system.

Receiving

Gasoline is delivered to the various sites by the company that has been awarded the bid through the procurement process. Gasoline is metered at the distributorship when the tank truck is filled. When the fuel is delivered to MCPS locations, it is "dumped," that is, it is not metered. If an auto service worker is on duty, which is not always the case, the storage tank is dipsticked before and after the fuel is dumped: the depth of fuel in the tank is measured in inches by a dipstick, and the reading is converted to gallons by use of a tank conversion chart. Oil and transmission fluid are received in both 55 gallon drums and one quart cans.

Dipsticking may not always produce accurate readings, and conversions may not reflect the amount of fuel that is actually delivered. Since tanks vary in size and shape, it is important to know the proper charts to use when converting dipstick measurements to gallons (an error of a quarter of an inch can equal 25 gallons of fuel). At the time of the audit, it was noted that there was some confusion about which tank charts to use for which tanks. The size of some tanks was determined by contractor specifications or blueprints, but the size of others could not be verified. There is also some confusion about whether or not some tanks are connected, a situation that would affect the accuracy of dipstick readings. That is, depending on the size of connecting lines, fuel delivered to one tank would not necessarily level off during or immediately after delivery, and this would affect dipstick readings if they were taken too soon.

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[1] Most of this chapter is devoted to gasoline. Control of transmission fluid and motor oil will be discussed only briefly when it is appropriate.

Storage and Security

Storage

Gasoline is stored in steel or fiberglass tanks. Tanks at the transportation depots generally hold 10,000 or 20,000 gallons, and the ones that are located at high schools for driver education vehicles usually hold 1,000 or 2,000 gallons. Drums of oil and transmission fluid are generally stored in the inside bay areas of the depots where mechanics and auto service workers can withdraw from them easily as they work on vehicles. The one-quart cans are stored at the service stations to be used when a vehicle has to be "topped up" between monthly servicing.

Security

Pumps and tanks are generally located in fenced facilities. A gas attendant (auto service worker) is usually, but not always, on duty during working hours. The Lincoln Center facility is apparently unmanned. Pumps at the high school driver education facilities are locked, and keys are controlled by driver education teachers. However, these pumps and tanks are not secure. Over the years, they have been vandalized, and gasoline has probably been pilfered. In addition, they have presented reporting and accounting problems.

General Description of
The GasBoy System

The computerized GasBoy system is the heart of the gasoline control system. Pumps at the depot lots (but not at other sites) are hooked into a central computer that is located at the division's central office at Shady Grove Road. A gas card is issued for every MCPS vehicle by the division accounts clerk. This card allows withdrawals of fuel from any MCPS or Montgomery

County Government GasBoy pump. With the insertion of special codes, cards can be made to limit the type and quantity of gasoline that can be withdrawn.

When gasoline is withdrawn, GasBoy records vehicle number, odometer reading, date and time of withdrawal, pump number, type product, and number of gallons pumped. Periodically, someone at the central office enters a special command into the computer, at which time, each location is automatically dialed up and the data stored at the site are transferred both to a computer printout and to magnetic tape. The tape is later used as a source of information for the transportation system, which supplies withdrawal data that are to be used by the Accounting Division.

MCPS vehicles can refuel at Montgomery County Government facilities throughout the county, which are also on a GasBoy system. However, the MCPS and the county government systems do not interface, so information does not flow from one to the other. Instead, a detailed listing from the county is received once a month, reflecting all of the information collected by the county GasBoy system. The information is manually transferred to a keypunch form and sent to the Data Processing Division to be keyed to tape. The tapes from MCPS GasBoy and from the county listing are merged and, as stated above, enter the transportation system.

Problems In The GasBoy System

Although the GasBoy system has the potential for providing useful information, it has been plagued by many problems. Therefore, a considerable amount of time during the audit was devoted to documenting and, in some cases, discovering those problems.

Cards and Odometer Readings

To withdraw gas, the driver of the vehicle must place the gas card in a "reader" and enter the pump number and the vehicle's current odometer reading. However, a driver will sometimes use a card that is assigned to a different vehicle than the one he is refueling, and thus the fuel that is pumped is charged against the wrong vehicle. The odometer reading is used by the Transportation system to determine fuel consumption by vehicle. However, the system can be activated by entering any series of numbers, not necessarily the correct and current odometer reading. This, of course, makes the information inaccurate and renders the data useless.

At every site, the GasBoy system can be switched from automatic (requiring insertion of a card) to manual mode. The switches are supposed to be secured by a locked cover. However, at all but one of the sites, the screws from the cover had been removed, allowing manual access at all times. At the time of a visit to one site, the "yard card" was lying on a table by the door and the pumps were unattended. The yard card is used to make miscellaneous withdrawals of gasoline for small equipment (lawn mowers, etc.) and can also be used temporarily to pump gas to a vehicle if, for some reason, the driver does not have the card assigned to the vehicle. Thus, an unprotected yard card, especially in combination with an unattended pump, represents a serious loss of control.

Pump Calibrations

Data relayed to the system via sensors located in the pumps were usually consistent with the meter readings on the pumps. However, tests performed using a calibrated five gallon test can indicated that frequently the actual amount of gas pumped was slightly different from the amount shown on the meter and reflected by the system.

Tests performed at all four depots showed that, on the average, for every 5 gallons of gasoline being registered on the pump meter, an additional 4.175 cubic inches was being pumped. Although this difference is minimal, when multiplied by approximately 2.5 million gallons pumped during the course of a year at $1.10 per gallon, it amounts to almost $10,000. In normal circumstances, the difference would not be detected, and the $10,000 would not be deducted from the general ledger inventory account. The loss, however, would contribute to any inventory adjustment that might be required.

Loss of Data

Staff members said that the computer memory banks at each site can be affected by electrical storms and that occassionally the entire memory can be knocked out if lightning strikes in the vacinity of a depot. When this occurs, the data that had been stored are lost and never enter the system. The seriousness of this situation is inversely related to the frequency with which data are retrived by the central office. The more often data are retrieved from the pumps, the smaller the loss when memory is wiped out.

Data Retrieval

If information stored at each site is not retrieved frequently, the memory bank fills up, further transactions are locked out, and the attendant has to switch to the manual system. In addition, as discussed above, if data are not retrieved frequently, an electrical storm can wipe out a large number of transactions and records. When key staff members are on leave, there is often no one with adequate knowledge of the system to see that information is properly retrieved from each site.

Control

There is no systematic method of controlling the accuracy of information collected by the GasBoy system. While the system automatically assigns a number to each transaction, there is no established procedure for verifying or logging beginning and ending numbers from one day to the next. There is also no system for comparing daily totals with final totals that are reflected on the monthly reports prepared by the transporation system.

Tape Conversion

Data retrieved from each site are recorded on magnetic tape by the GasBoy system. The GasBoy system, however, is not compatible with the MCPS central computer. Before information can be used to update the transportation system, the tapes have to be sent to the Credit Union to be converted to a usable format. This increases lag time and the chance of losing data, because no system is in effect to assure that the converted tape includes everything that was on the original.

Manual System

The System

A manual system of recording gasoline withdrawals is used at all sites other than automotive depots and as a back-up should GasBoy become inoperative. The manual system is also used to record oil and transmission fluid withdrawals at all service stations.[2] In both cases, pertinent information is recorded manually on a withdrawal ticket. The ticket is sent to Data Processing to be keyed to tape before being entered into the transportation system.

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[2] This applies to quart containers stored at service stations. Withdrawals from drums at inside work stations are recorded on repair orders.

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Problems

The audit showed there are two major weaknesses in the manual system: control and security. There is no established control to assure that tickets are actually written for withdrawals of gas, oil, or transmission fluid. There is no control system to assure that tickets that are written get entered into the system. It was noted during the course of the inventory that the tickets at one school site had not been collected since the previous inventory, a period of seven months. Finally, although withdrawal tickets are imprinted with sequential numbers, there is no system for logging or otherwise accounting for the numbers of the tickets that are used.

Security is often almost nonexistent. On one trip to the Lincoln Center, the gas shack was found to be unattended, the door was open, and the keys to both the door and the gas pumps were hanging on the door. Responsibility for writing a withdrawal ticket was left to drivers. In addition, on audit trips to the schools that have gas tanks, it was noted that filler caps for tanks were not secure. In most cases, locks were in place, but the caps could easily be removed, making the gasoline highly susceptible to theft or vandalism.

Staffing

It is mentioned in several places in this chapter that fuel tanks and pumps at the depots are not always under the control of an attendant. Auto service workers are assigned service station duty, but this is only one of the many jobs for which they are responsible. When they have to perform other essential duties (are absent, etc.), the service station is untended. This, of course, means that when fuel is delivered, there may be no one on duty to dipstick the tanks and that drivers fuel and service their own vehicles. In turn, many of the problems that have been discussed previously can occur: the use of the wrong gas card, incorrect odometer readings, etc. Furthermore, even when an auto service worker is on duty at the service station, he has no authority over drivers and would have difficulty trying to enforce controls. Supervising auto mechanics, the heads of depots, also have very limited authority over drivers and, in any case, do not have time (see Chapter 21) to deal with the many problems of control at the pumps.

Discussion

Fuel Delivery and Receiving

For some time in the future, MCPS will probably continue to get unmetered deliveries of gasoline, and therefore there should be reasonable certainty that the amounts received are the amounts paid for. At a minimum, dipstick readings should be made before and after every delivery. Pumping must cease during this process, and if tanks are linked together, the fuel must be given sufficient time to level off before a reading is made. Any discrepancies should be brought to the attention of the supervisor of automotive maintenance (perhaps using report forms developed for the purpose), and necessary follow-up should be made within MCPS and with the vendor until differences are reconciled.

The success of the system depends on the accuracy of tank conversion tables, and therefore they should be verified. If accurate information is not available, capacities could be verified by trial and error, i.e., by comparing tank charts with daily dipstick and meter readings until a consistent match is found. Once the proper charts have been identified, a master record should be maintained at the Shady Grove central office. Each service station should be supplied with a chart that is numbered or color coded to identify the specific filler location it represents. Both the central office and the service stations should have a record of which pumps use which tanks and of which tanks are linked together.

Accurate calibration of MCPS pumps would serve as another control, since pump readings would provide a check on the accuracy of daily dipstick readings. The frequency with which pumps should be calibrated should be dictated by industry standards (assuming there are such standards).

Should it turn out that these measures do not provide adequate control over the quantity of fuel received, an investigation would have to be made by the Transportation Division to determine if other methods are available and feasible. At current prices, MCPS would have to pay an extra three cents per gallon for gas that is metered on delivery than for gas that is dumped. This would amount to about $75,000 in the typical year. However, it is possible that the difference in cost might be offset by greater control. It is also possible that MCPS could purchase portable metering devices of its own, though there might be an extra charge if the contractor's drivers had to wait while fuel is being metered.

Security

Security should be improved to prevent unauthorized or uncontrolled withdrawals of gasoline, oil, and transmission fluid. Pumps should not be left unattended during normal working hours (see staffing recommendations). GasBoy memory banks should be securely locked to prevent unauthorized people from deactivating them and switching to the manual mode. When it becomes necessary to switch to manual mode, meter readings should be recorded at both the beginning and end of the period the manual system is in use and the amount of gasoline pumped during this period should be reconciled with the withdrawal tickets. Security over yard cards should be increased to prevent unauthorized use and to make sure that pertinent information is recorded each time a yard card is used. Logs of yard card transactions should be reconciled with the records produced by the GasBoy system.

In the immediate future, the Transportation Division should make provisions to guarantee that filler caps of the tanks at Sherwood facility are locked. Driver education teachers, who are responsible for the keys to tanks on high school lots, should be required to guarantee that filler caps are locked to prevent unauthorized withdrawals or vandalism. If this remedy does not work, serious consideration should be given to closing down these fueling facilities. The impact of this on driver education and on the service stations operated by automotive services could not be determined, because a study of the problems involved was beyond the scope of this audit.

GasBoy System

When a memory bank at one of the GasBoy pump sites is allowed to fill up, computerized transactions are locked out. This forces the attendant to switch to manual mode, and the advantage of a computerized system is lost or suspended. In addition, data can be lost from the memory bank. Therefore, data should be retrieved from all sites at least once a day. Since memory banks are susceptible to the effects of electrical storms, data should be retrieved more frequently during hot weather (May through September) when such storms are likely to occur, perhaps even hourly during periods of heavy use.

Data and Reports

The gasoline system generates a considerable amount of data, but, at present, much of the information is not readily available and is not being used. The Transportation Division and the Data Processing Division should work together to develop some meaningful reports that could be used as management tools; among them should be the following:

- Comparison odometer readings

  This could be an exception report that would flag unusual odometer readings that are entered into the system, e.g., to determine if readings are progressively larger by chronological order. This would serve as a control on the entry of meaningless numbers that are punched in to trigger the delivery system.

- Miles per gallon

  A report of miles per gallon between refueling would identify cases of improper use of delivery cards, removal of gasoline from vehicles (e.g., by siphoning), etc., by showing deviations from the norm.

- Pump location information

  A report of details and totals by pump and location within specified date and time limits would provide control information about daily pump meter readings.

Perpetual Inventory System

With some additional work, a modified perpetual inventory system could be developed to permit a computerized comparison of all pump meter readings (daily readings by attendant and GasBoy readings), dipstick measurements, and delivery readings. A system of this kind would be invaluable for control purposes and would eliminate the need for some of the manual controls discussed previously. However, it would require more systems development because additional data would have to be entered.

Staffing and Training

Virtually all of the controls that are needed at service stations could be exercised by full time service attendants whose only jobs would be monitoring (dipsticking) fuel levels and deliveries, taking pump readings, pumping gas, adding oil and transmission fluids to vehicles, and controlling the security of pumps and yard cards. Before pumping fuel, attendants could check gas cards to guarantee that they are the ones assigned to the vehicles. They could also check (or make certain drivers did so) and enter correct readings into the system. In Chapter 23, it was shown that positions of service station attendants can be created at some saving in salary costs. Service stations attendants would have no more authority over drivers than auto service workers now have. However, it was recommended in both Chapter 15 and Chapter 23 that dispatchers, who would have such authority, should be assigned to depots. Thus there would be someone with "clout" to whom service attendants could report problems experienced with drivers.

At the time of the audit, the only person who seemed to have a reasonable amount of knowledge about the gasoline system was the accounts clerk, who has been given complete responsibility for the computerized inventory. Considering the size of the inventory and the complexity of the problems, the supervisor of automotive maintenance should be responsible for coordinating and managing the systems and, if necessary, should be given appropriate training to enable him to do so.

At Long Range

Implementing the recommendations made here would provide some immediate and useful controls over the gasoline system. However, all problems would not be solved. For example, GasBoy is not now compatible with the MCPS mainframe and cannot be maintained by MCPS programmers. This leads to such problems as having to send GasBoy data to the Credit Union to be converted into compatible tapes, which causes delays in data processing and the production of reports. Therefore, the entire gasoline inventory, accounting, and reporting system should be evaluated. At long range, it seems as if MCPS has the following three choices:

- o "Beefing up" the current system, including implementing recommendations made in this chapter and eliminating inefficient operations (sending tapes for conversion, for example).
- o Returning to a manual ticketing system and recognizing the "trade-offs" between speed of processing and the cost of labor and hardware.
- o Starting from scratch and totally redesigning the entire system, perhaps with new hardware and software, and instituting all essential controls and management information features.

Determining which approach should be adopted would take a considerable amount of study and cost analysis.

Recommendations

- o All of the recommendations made in this chapter for control on fuel delivery, security, and control of the present gasoline system should be implemented.
- o The Transportation Division and the Data Processing Division should work together to develop additional reports that can be used as management tools, including reports recommended here.
- o The Transportation Division and the Data Processing division should carry out a feasibility study on the development of a completely computerized perpetual inventory system and make a report to the associate superintendent for Supportive Services.
- o Positions of service station attendants should be created as recommended in Chapter 23, and attendants should be made responsible for controlling gas delivery and pumping operations and for taking readings as recommended in this chapter.
- o The position of dispatcher should be created as recommended in Chapter 15, and one dispatcher should be assigned to each automotive depot. Dispatchers should be given authority to enforce gasoline control measures.
- o The supervisor of automotive maintenance should be made responsible for coordinating and managing all computer inventory operations and should be given any training that he may need to carry out these responsibilities.
- o A task force should be formed to investigate the alternatives to the present gasoline system, perform cost-benefit studies, and make a report to the associate superintendent for Supportive Services. The task force should be made up of representatives from the Divisions of Transportation, Data Processing, and Accounting.

APPENDIX A

METHODOLOGY

APPENDIX A: METHODOLOGY

Preliminary Phase

To identify the issues to be investigated in this study, members of the project staff conducted a preliminary literature search and met informally with directors of the Department of School Services and the Division of Transportation. The questions raised and the issues identified were put in the form of a matrix that was circulated to departmental and divisional administrators for comments and revisions. Thereafter the project staff developed a plan for collecting the information and data needed to answer the questions.

Documents, Interviews, and Studies

A large number of documents were collected, most of them supplied by department or division administrators and their clerical assistants. They included memoranda, reports, records of budget question and answers, and far too many others to list here. All were reviewed and analyzed by the project staff.

After the preliminary interviews, a series of follow up interviews were conducted with the director of the Division of Transportation and central office managers. During the course of the study the project team also interviewed the following:

- o Area transporation supervisors and depot supervisors
- o Managers of the Supply Division and Maintenance Division
- o Montgomery County Ride-On and Transportation Department managers
- o MSDE transportation specialists
- o Directors of public school transportation in other Maryland counties and other states

After most data had been collected, final interviews were held with Transportation Division managers and supervisors.

The following topics that were identified as issues required substantial research and, in themselves, were almost equivalent to major studies:

- Comparison of costs of diesel and gasoline powered vehicles[1]
- Alternative fuels: liquid propane, compressed natural gas, liquid natural gas
- Fuel additives that are purported to increase fuel mileage
- Computer assisted routing of school buses
- The use of seat belts on school buses

Questionnaires

Five separate questionnaires were developed and distributed. Three were directed to MCPS personnel: principals, drivers, and automotive maintenance staff.[2] Two questionnaires were sent to parents, one to parents of children in the regular education program and a separate one to parents of children in the special education program.

Questionnaires were distributed to all school bus drivers, mechanics, auto service workers, tire repairers, and school principals. It was not considered desirable or cost-effective to distribute questionnaires to the parents of all 50,000 children who ride school buses. The MORE staff therefore drew a random sample of regular education pupils eligible for transportation (as indicated in the pupil data base). The sample did not differ greatly from actual MCPS distributions by school administrative area. There was some over-representation in the sample of the upcounty area; however in rural areas more pupils are likely to be transported. The percentage of junior and senior high school pupils in the sample was somewhat higher than the actual percentage of these pupils in the population. This would be reasonable because junior and senior high schools cover larger attendance areas than elementary schools, and a larger number of pupils live beyond the walking distance. The special education sample was drawn from pupils eligible for transportation and enrolled in special education program Level 3, 4, and 5.

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[1] C. A. Seitz and E. Cohen-Rosenthal, A Comparison of Costs: Diesel and Gasoline Powered Vehicles, Department of Educational Accountability, Montgomery County Public Schools, September, 1981

[2] Automotive maintenance staff included supervising automotive mechanics, lead automotive mechanics, automotive mechanics, automotive service workers, and tire repairers.

The sample was drawn in such a way as to ensure sufficient responses from parents of pupils with handicapping conditions (such as the orthopedically impaired) that require special transportation equipment and assistance.

Exhibit A.1 shows the total county populations from which samples were drawn, the number and percentage of each population included in the sample, and the number returning questionnaires as a percentage of the sample and of the population. The response rate for both of the parent questionnaires was very good for a direct mail survey. The sizes of all response samples are sufficiently large to give a high degree of statistical confidence in the results and to permit generalizing the data to the populations from which the samples were drawn.

Time-Task Study

The MORE team conducted a week-long time-task study at the three area transportation offices to determine the following:

- Jobs done or jobs for which staff are responsible but are not done
- Jobs done with highest frequency and that absorb the greatest amount of staff time
- Distribution of work among staff
- Typical work patterns in a day and in a week

Before carrying out the study, the project staff reviewed job descriptions, observed what jobs are done and by whom, and asked support staff in the Transportation Division and other MCPS units what jobs they typically do. This information was used to develop a form that was precoded with the jobs staff members in various positions actually do or are responsible for.

The procedure and a similar form are typically used in personnel studies. Each staff member recorded on the form the code of the job being done at the end of every 10-minute interval throughout the work day. A separate form was used for each day of the week. The assumption is not that the individual worked on the recorded task for the entire 10-minute interval but that tasks recorded most frequently are those that are done most often and take the greatest amount of staff time. Data were analyzed by tabulating the number and percentage of times particular tasks were recorded and by grouping data for both individuals and occupational groups (all secretaries, all clerks, etc.).

Exhibit A-1

POPULATIONS, NUMBER IN SAMPLES, AND NUMBERS RESPONDING TO QUESTIONNAIRES

Questionnaire	Number in Population	Percentage of Population Sampled	Percentage as Percentage of Sample	Returned as Percentage of Population
Parents:				
Regular Program	48,000[a]	4[b]	2	54
Special Education Program	3,856[c]	40	14	34
Drivers:				
All	614	100	34	34
Special Education	182	100	36	36
Mechanics/Auto Service Workers/Tire Repairers	70	100	66	66
Principals	178	100	87	87

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[a] Number is actually rounded number of pupils eligible for transportation enrolled in the regular program.

[b] An attempt was made to include only one child per family in the sample. Parents who received questionnaires for two or more children were asked to answer one for only the youngest child.

[c] Population is defined as eligible for transportation and enrolled in special education programs Levels 3, 4, or 5.

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It should be mentioned that a week before the study, the MORE team met with staff members to explain the purpose of the study and to instruct the staff in the use of the precoded form. The week selected for the study was one in which the support services payroll does not have to be prepared, because the MORE team had reason to believe that a considerable amount of time is devoted to payroll even during the interval between payrolls (this turned out to be true).

APPENDIX B

MORE ROUTING STUDY

APPENDIX B: MORE ROUTING STUDY

Purpose And Limitations

The Division of Administrative Analysis and Audits contracted for an independent routing study to determine the effects of the following on route mileage and costs:

- Basing bus stops and routes on pupil's addresses instead of on load counts and other historical information
- Concentrating on reducing route mileage
- Enforcing existing MCPS transportation regulations

Because time and funds were limited, it was decided that the study would be carried out in stages as follows:

- Analyze and, whenever possible, redesign the routes of buses serving one high school. If it could be shown that mileage and costs could be decreased, the study would not go on to the second stage.
- If mileage and costs could not be decreased in the first stage of the study, the routes of buses serving the high school's feeder junior high school would be analyzed and, if possible, redesigned. If mileage and costs could be reduced at this stage, the study would not go on to the final stage.
- If mileage and costs could not be reduced in the second stage, routes of buses serving the junior high school's feeder elementary schools would be analyzed and, if possible, redesigned.

As it turned out, the study did not have to be carried beyond the first stage because the contractor was able to demonstrate reductions of mileage on the high school routes, which meant that costs could also be reduced.

Contractor

The individual who was selected to perform the study was Mr. Ben Hartmann, supervisor of transportation of the Howard County (Maryland) Public Schools (HCPS). The following were the reasons for selecting Mr. Hartmann:

- In telephone surveys of other school systems, the MORE staff were told that the transportation unit of HCPS is particularly good at planning routes.
- HCPS contracts bus service and bases payment to contractors on route mileage. One of the most important jobs of the transportation staff is to plan routes to reduce mileage and therefore to reduce costs for MCPS.

- Mr. Hartmann was previously employed by the MCPS Transportation Division, is familiar with the Montgomery County road network, and understands the conditions of operation of school buses in MCPS.

Conditions Of Study

The study was carried out under the following conditions and monitored by the MORE staff:

- The transportation staff in Area 1 were asked to identify a suitable high school for the first stage of the study. They identified Kennedy High School as a typical MCPS high school with normal routing problems.

- Buses assigned and routes planned by the MCPS Transportation Division for FY 1982 served as standards for comparison.

- New stops and routes planned by the contractor were based on the following:

  - Addresses of pupils who attended the school in FY 1982

  - Walk-ride boundaries established by MCPS regulation

- The contractor was to adhere to and apply all MCPS transportation regulations but would be free to disallow transportation exceptions provided that walking routes to school were field checked for safety.

- New stops or routes planned by the contractor would be field checked and proved safe for pupils and buses.

Procedure

The contractor followed normal procedures for designing bus stops and routes based on students' addresses. The steps were as follows:

- Obtained address map (200 feet to the inch) for the Kennedy High[1] School area from the Maryland-National Capital Park and Planning Commission.

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[1] A scale of 1:2400 (200 feet to the inch) is a large scale, highly detailed map that permits very precise measurement with a map wheel, a commonly used tool in cartography and transportation.

- Interviewed transportation staff to determine FY 1982 school bus routes for Kennedy High School, wrote route descriptions and plotted routes. Measured routes with map wheel to obtain basic comparative data.

- Plotted school attendance area and walk-ride boundaries on address map in accordance with MCPS Transportation Division policy and in conformity with maps supplied by the Planning Division.

- Obtained from the Department of Educational Accountability names and addresses of pupils attending Kennedy High School in FY 1982.

- Plotted all pupils by address on large-scale address map.

- Plotted bus stops according to pupil's addresses. Connected stops by most efficient routes and determined bus assignments.

  Note that at this point many decisions had to be made, various bus assignments and alternate routes had to be tried out on the map, and stops and walking routes had to be field checked.

- Measured final routes with map wheel.

- Compared FY 1982 actual mileage with proposed route mileage.

Results

The major products of the study were the very large map sections on which routes were plotted and a set of route descriptions. Because of their size and volume they cannot be included here, but are available for inspection at the office of the Division of Administrative Analysis and Audits. However, the most important results of the study are presented in Exhibit 13.4, Chapter 13, and are repeated here in Exhibit B.1. It should be mentioned that actual MCPS bus numbers are not used in the exhibit because it would be misleading. That is, in redesigning routes and reassigning buses, the contractor was not able to make an exact match of bus numbers and assignments in all cases. However, this does not affect mileage totals or the amount of reduction in mileage.

It can be seen in Exhibit B.1 that in 6 cases (35 percent), the contractor was not able to reduce mileage and that in 3 cases, the contractor extended the length of routes so as to be able to shorten other routes. Overall, however, cumulative one-way route mileage was reduced by 15.4 miles, an average of .91 miles per bus. Though not shown in Exhibit B.1, in some cases the contractor "transported" pupils who live within the walk-to-school boundary because of unsafe walking conditions or because the boundary line is drawn to include all pupils of a given community. In other cases, he "enforced" MCPS regulations and disallowed transportation exceptions for pupils who live on safe walking routes (checked in the field for safety). The implications of the study findings and projections of cost reductions based on the data are discussed in Chapter 13.

Exhibit B.1

ACTUAL AND PROPOSED ROUTE MILEAGE[a] OF BUSES SERVING KENNEDY HIGH SCHOO: FY 1982

(One Way Mileage, Morning Run)

Bus[b]	Actual Miles	MORE Study Proposed Miles
1	4.3	4.3
2	7.4	7.4
3	4.3	4.3
4	7.4	9.2
5	4.7	4.7
6	7.0	6.4
7	6.8	6.2
8	7.0	6.2
9	7.6	5.5
10	5.3	4.7
11	12.8	8.1
12	8.9	0.0[c]
13	8.0	8.0
14	5.9	5.9
15	8.7	6.8
16	4.9	7.3
17	5.1	5.7
TOTAL	116.1	100.7
DIFFERENCE		-15.4 miles
AVERAGE REDUCTION PER BUS		0.91 miles

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[a] In both cases, mileage includes "deadhead" mileage from depot to beginning of route. High school runs are the earliest and buses leave from depots, not from other schools as they do on later runs.

[b] Numbers are not actual MCPS bus numbers (see Appendix B).

[c] This route eliminated in proposed routing plan.